

NAVAL AIR STATION NORTH ISLAND

PROGRAM GUIDE










EDITION 3
JULY 1996

NAVAL AIR STATION NORTH ISLAND









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ACRONYMS AND ABBREVIATIONS

2-D	2-dimensional
3-D	3-dimensional
AIRCON	Mobile Air Conditioner
AIRPAC	Commander, Naval Air Forces, U.S. Pacific Fleet
AIMD	Aircraft Intermediate Maintenance Department
ALFA	Activity land and facility assests
APCD	Air Pollution Control District (San Diego County)
AST	Aboveground Storage Tank
BCI	BioConverters, Inc.
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylene
BTF	Bioremediation Treatment Facility
CA	Cooperative Agreement
Cal EPA	California Environmental Protection Agency
CATOX	Catalytic Oxidation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	Chlorofluorocarbon
cfm	Cubic Foot Per Minute
CINCPACFLT	Commander in Chief, Pacific Fleet
CLEAN	Comprehensive Long-Term Environmental Action Navy
CNG	Compressed Natural Gas
CNO	Chief of Naval Operations
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COMNAVAIRPAC	Commander Naval Air Force, U.S. Pacific Fleet
COMNAVBASE	Commander, Naval Base (San Diego)
CRA	Cooperative Research Agreement
CrO ₃	Chromium Trioxide
CRMP	Cultural Resources Management Program
CY	Calendar Year
dB	Decibels
DENIX	Defense Environmental Information Exchange
DoD	Department of Defense
DOT	Department of Transportation
DNAPL	Dense Non-aqueous Phase Liquid
DTSC	Department of Toxic Substances Control
EDM	Engineering Design Module
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EQMB	Environmental Quality Management Board
ERC	Emissions Reduction Credit
ERMA	Environmental Response Management Applications
ERU	Electrolytic Recovery Unit
FALT	Fully Automatic Line Tester
FIS	Force Information System
FISC	Fleet Industrial Supply Center
FLEDS	Flight Line Electrical Distribution System
FY	Fiscal year

ACRONYMS AND ABBREVIATIONS (Continued)

GAC	Granular Activated Carbon
GIS	Geographic Information System
gpm	gallons per minute
GSA	General Services Administration
GSE	Ground Support Equipment
H ₂ O	Water
HDPE	High-density polyethylene
HMMD	Hazardous Materials Management Division
HQ	Headquarters
HVEA	High Voltage Environmental Applications, Inc.
IPA	Isopropyl Alcohol
IPM	Integrated Pest Management
IR	Installation Restoration
IT	International Technology Corporation
kHz	Kilohertz
LEV	Low Emissions Vehicle
LIBS	Laser-induced Breakdown Spectroscopy
LIF	Laser-induced Fluorescence
LNAPL	Light Non-aqueous Phase Liquid
MACT	Maximum Achievable Control Technology
MALT	Manual Line Tester
MAP	Management Action Plan
MCL	Maximum contaminant level
MEPP	Mobile Electric Power Plant
mg/L	Milligram per Liter
N/A	Not Applicable
NADEP	Naval Aviation Depot
NATOPS	Naval Air Training and Operating Procedures and Standardization
NALF	Naval Auxiliary Landing Field
NAS	Naval Air Station
NASNI	Naval Air Station, North Island
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVOSH	Naval Occupational Safety and Health
NAVSTA	Naval Station
NAWC	Naval Air Warfare Center
NAWCADLKE	Naval Air Warfare Center Aircraft Division, Lakehurst, New Jersey
NCCOSC	Naval Command, Control, and Ocean Surveillance Center
NELP	Navy Environmental Leadership Program
NFESC	Naval Facilities Engineering Service Center
NOLF	Naval Outlying Field
NOV	Notice of Violation
NO _x	Nitrogen Oxides
NRI	Northeast Research Institute
NRO	Natural Resources Office
NS	Naval Station
NSR	New Source Review

ACRONYMS AND ABBREVIATIONS (Continued)

NT	New Technology (SWDIV Innovative Technology Solicitation)
NTI II	NELP Technology Initiative II (NFESC Innovative Technology Solicitation)
ODS	Ozone depleting substances
ODUSD(ES)	Office of the Deputy Under Secretary of Defense (Environmental Security)
OPNAVINST	OPNAV (CNO) Instruction
ORD	Office of Research and Development (EPA)
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response (EPA)
P2	Pollution Prevention
PAO	Public Affairs Office
PAT	Process Action Team
PCBs	Polychlorinated Biphenyls
PCO	Photocatalytic Oxidation
PMB	Plastic Media Blast
PNOV	Potential Notice of Violation
ppm	Parts per Million
PRC	PRC Environmental Management, Inc.
PWC	Public Works Center
RCRA	Resource Conservation and Recovery Act
RD&D	Research, Development, and Demonstration
RDT&E	Research, Development, Test, and Evaluation
RFP	Request for Proposal
ROICC	Resident Officer In Charge of Construction
RPM	Remedial Project Manager
RRI	Resolution Resources, Inc.
RWQCB	Regional Water Quality Control Board
SALT	Semi-automatic Line Tester
SAM	Site Assessment and Mitigation Division
SCAPS	Site Characterization and Analysis Penetrometer System
SCE	Staff Civil Engineer
SDG&E	San Diego Gas and Electric
SERE	Survival, Evasion, Resistance, and Escape
SHSU	Sam Houston State University
SITE	Superfund Innovative Technology Evaluation (EPA)
SOP	Standard Operating Procedure
SRS	Site Restoration Solutions
SUPSHIPS	Supervisor of Ship Building
SVE	Soil Vapor Extraction
SVOC	Semivolatile Organic Compound
SWDIV	Southwest Division Naval Facilities Engineering Command
TCE	Trichloroethylene
TIO	Technology Innovation Office
TSCA	Toxic Substances Control Act
UHF	Ultra High Frequency
URL	Uniform Resource Locator
UST	Underground Storage Tank
VOC	Volatile Organic Compound

ACRONYMS AND ABBREVIATIONS (Continued)

VS-41	Air Antisubmarine Squadron-41
WPRG	Western Product Recovery Group
WWW	World Wide Web
ZEV	Zero Emissions Vehicle

EXECUTIVE SUMMARY

This guide to the Navy Environmental Leadership Program (NELP) describes the ongoing and demonstrated innovative environmental solutions underway at Naval Air Station (NAS) North Island in San Diego, California. In addition to projects developed specifically under NELP, initiatives that were developed in the course of conducting other environmental programs at NAS North Island are provided.

RECENT ACCOMPLISHMENTS

Accomplishments since issuance of the NELP Guide Edition 2:

- The Terra-Kleen soil washing technology, successfully demonstrated in May 1994, is being used to remediate polychlorinated biphenyl (PCB) -contaminated soils under a removal action at Sites 4, 6, and 10. Use of the Terra-Kleen technology for the removal action is estimated to save the Navy more than \$5 million as compared to the cost of off-site incineration.
- The Thermatrix flameless thermal oxidation technology, a non-flame, packed-bed oxidizer, was successfully demonstrated in June 1995 to destroy volatile organic compounds (VOC) during JP-5 fuel transfer and dispensing at the NAS North Island Fuel Farm. During three test runs, the Thermatrix technology achieved destruction removal efficiencies greater than 99.99 percent.
- A Bioremediation Treatment Facility has been constructed by Navy Public Works Center (PWC) at NAS North Island. The facility received a Class II designated waste facility permit, and began treating hydrocarbon-contaminated soil in May 1996. On-site treatment of contaminated soil will significantly reduce the cleanup cost at NAS North Island.
- EnviroCom software was installed in January 1996 to automate the air emissions tracking system at Naval Aviation Depot (NADEP) North Island. It is estimated that NADEP North Island will save \$250,000 annually by completing toxic inventories in-house using the EnviroCom system.
- Pollution Prevention (P2) equipment, procured through the Chief of Naval Operations (CNO) centralized procurement process, including a drum washer, "SmartWasher" aqueous parts washer, and plastic medial blast (PMB) booth, were installed and tested in NAS North Island maintenance facilities; initial feedback on operation of the P2 equipment has been positive.
- An isopropyl alcohol (IPA) vapor degreaser, designed to replace a freon vapor degreaser, was successfully demonstrated at NADEP North Island. The IPA vapor degreaser eliminated the use of a Class I ozone depleting substance and resulted in cost

savings of \$21,750 per year.


Some additional accomplishments are as follows:

- An electronic version of the NELP Guide, Edition 2 was placed in the Defense Environmental Network Information Exchange (DENIX) in July 1995.
- NAS North Island prototyped training for the U.S. Environmental Protection Agency (EPA) and Department of Defense (DoD) "Envirosense" World Wide Web P2 Project in November 1995.
- NAS North Island hosted a video crew to shoot scenes for a Navy P2 video sponsored by CNO in November 1995.
- A demonstration of Vista Research Manual Line Tester (MALT) was completed at NAS North Island Fuel Farm in April 1996.
- A kickoff meeting was held to plan a demonstration of EG&G "NoVOCs" in-well air stripping technology in December 1995. This demonstration will be performed under a cooperative partnership of regulatory programs including EPA's Technology Innovation Office, Clean Sites, Inc., and SITE programs.
- A Kodak DC-40 digital camera was received through NELP procurement in February 1996. The digital camera is expected to increase the efficiency and capabilities of the environmental program at NAS North Island.
- The JP-5 fuel recycling system was installed at the NAS North Island Fuel Farm in March 1996. Staff Civil Engineering Department released an official standard operating procedure for squadron-level fuel segregation.
- Installation of a prototype flight line electrical distribution system (FLEDS) was completed at Hangar Building 1456 at NAS North Island in March 1996.
- Twelve plastic pier pilings at Pier Bravo was installed in April 1996.
- The 1994 Management Action Plan was updated and issued in March 1996.
- A burrowing owl nesting area was constructed in 1996.
- NELP was established on the World Wide Web in May 1996. The uniform resource location (URL) address is <http://www.nasni.navy.mil/~nelp/nelp.htm>.
- The EET decontamination technology was demonstrated at NADEP North Island facilities in June 1996.

PROJECTS UNDERWAY

Fifty-four projects have been initiated or are underway at NAS North Island. These projects have been organized into four categories:

- Cleanup
- Compliance
- Conservation
- Pollution Prevention

Table 1 lists and summarizes NELP projects. New projects are denoted with a “.










 Detailed project summaries are provided in the guide.



UPCOMING MILESTONES AND PROJECTS ON THE HORIZON




In addition to finishing documentation for projects recently completed, the following major milestones are expected in the remainder of calendar year (CY) 1996:








- The time-critical removal action at Sites 4, 6, and 10 is in its final stages. The removal action incorporates the Terra-Kleen Response Group's innovative soil washing technology and a risk-reducing treated soil placement strategy and will be completed in September 1996. These removal actions are anticipated to result in closure of Sites 4 and 6.
- The following cleanup technology demonstrations are expected to be initiated in 1996: EG&G NoVOCs system, Fifco International Inc.'s Bac-Terra In Situ Bioaugmentation Demonstration, and Global Associates Catalyst Enhanced Bioremediation technology.
- A NADEP North Island P2 implementation handbook that is intended to export successful P2 strategies and technologies is being prepared.
- NELP is establishing a prorated incentive system to credit squadrons for recycled fuel segregated using the JP-5 fuel recycler.

TABLE 1
NELP PROJECT SUMMARY

PROJECT	STATUS
Cleanup	
 CAD-2 Environmental Modeling System	Windows NT workstations with Intergraph GIS software purchased and installed. Implementation of activity land and facility assets (ALFA) environmental module is currently being pursued. Active.
 Fifco International, Inc. Bac-Terra In Situ Bioaugmentation Demonstration	Research, development, and demonstration (RD&D) permit application was submitted to California EPA (Cal/EPA) Department of Toxic Substances Control (DTSC) in January 1996. Awaiting permit approval to proceed with demonstration. Active.
 Global Associates Catalyst Enhanced Bioremediation Technology	RD&D permit application was submitted to DTSC in January 1996. Permit approval is awaited to proceed with demonstration. Active.
 Western Product Recovery Group Chemical Coordinate Bonding and Adsorption Technology	Bench-scale treatability study was conducted; preparation of treatability study report is underway. Active.
 NoVOCs™ In-Well Stripping Technology	RD&D permit application submitted to DTSC. Awaiting permit approval to proceed with demonstration. Active.
 Pilot SVE/Air Sparging/Catalytic Oxidation System	Pilot study was successfully completed. Full-scale soil vapor extraction (SVE) system being constructed at Sites 9 and 11. Completed, exportable.
 Site 9 Offshore Sampling for VOCs	Innovative soil gas sampling technique successfully used to identify and delineate migration pathways for contaminated groundwater at Site 9. Completed, exportable.
 Enviro-Core Continuous Soil Core Sampler	Field demonstration was conducted. Sampler was used to collect site characterization data at Sites 2, 5, and 7. Completed, exportable.
 NovaTerra In Situ Stabilization/Solidification Pilot Study	Work plan was drafted. Contractor was non-responsive. No demonstration is planned. Completed, not exportable.
Terra-Kleen Soil Washing Technology at Sites 4,6, and 10	Demonstration reports and fact sheets were completed; EPA Innovative Technology Evaluation Report in preparation. Technology is being implemented full-scale under time-critical removal action at Sites 4, 6, and 10; remediation is expected to be completed in September 1996. Completed, exportable.

PROJECT	STATUS
Cleanup (continued)	
Zenon Pervaporation Technology	Field-scale demonstration was completed; preparation of the EPA Innovative Technology Evaluation Report is underway. Completed, exportable.
Bioremediation Treatment Facility	Permits were approved by Regional Water Quality Control Board (RWQCB); construction of Bioremediation Treatment Facility is complete; facility is in operation. Completed, exportable.
2-D and 3-D High-Resolution Seismic Reflection Surveys	2-D and 3-D seismic imaging surveys were conducted at Site 9; report has been issued and included in Site 9 remedial investigation report. Completed, exportable.
Site Characterization and Analysis Penetrometer System (SCAPS)	SCAPS has been certified by Cal/EPA DTSC and is being used to delineate soil contamination at other military installations; further development work is continuing at NAS North Island for characterization of metals and gasoline contamination. Completed, exportable.
Expedited UST Closure	Site was remediated; regulatory closure was received. Completed, exportable.
Demonstration Permitting Procedures Flowcharts	Flowcharts were completed February 1995. Completed, exportable.
HVEA Electron Beam Technology	Laboratory-scale treatability study was conducted; report was submitted. Completed, not exportable.
BioConverters Bioremediation Technology	Treatability study was completed; report was submitted. Completed, not exportable.
IT Corp. In Situ Groundwater Treatment Technology	Negotiations did not result in an acceptable cost sharing agreement; no demonstration is planned. Completed, not exportable.
Sevenson Maectite Fixation Technology	Bench-scale treatability study was conducted; report was completed. Completed, not exportable.
BioConverters Fuel Farm Treatability Study	Pilot-scale treatability study was completed. Completed, not exportable.
Compliance	
 Vista Research, Inc. Pipeline Leak Detection	Demonstration was completed in November 1995. Third-party verification was completed; certification was submitted to State of California for final approval. Active.
 EET, Inc. TextXtract Chemical Decontamination Technology	Demonstration was completed; final project report is awaited. Active.

PROJECT	STATUS
Compliance (continued)	
 Management Action Plan	First update to Management Action Plan was completed in March 1996. Annual updates are planned. Completed, exportable.
 Digital Camera	Digital camera was procured. Completed, exportable.
 Thermatrix, Inc. Flameless Oxidation Technology	Successful demonstration was completed in July 1995; demonstration report issued in November 1995. Completed, exportable.
Ground Support Equipment Air Emissions Reduction	Modification of ground support equipment (GSE) to use low-emission engines is underway; flight line electrical distribution system was installed at NAS North Island Hangar 1456. Project is under evaluation. Active.
Emission Reduction Credit Demonstrations	Identification of projects to demonstrate the emission reduction credit (ERC) process and validate regulatory interpretations is planned. Active.
EnviroCom Air Emissions Tracking System	EnviroCom software was installed and tested in 1996. Project is under evaluation. Active.
Self Inspection Program	NADEP North Island inspectors continue to minimize regulatory enforcement actions by issuing Potential Notices of Violation (PNOV) to increase awareness. Result: No NOV's in 1993, 1994, or 1995. Completed, exportable.
Air Quality Regulatory Flowcharts	Flowcharts interpreting San Diego County Air Pollution Control District rules for New Source Reviews (NSR) and ERCs was developed. Completed, exportable.
Waste Classification Flowcharts for Contaminated Soil	Flowcharts providing guidance for waste classification of contaminated soil generated by cleanup activities were developed. Completed, exportable.
Mesh Pad Demister	Mist eliminator was installed at NADEP's Plating Shop in March 1994; it achieved 99.8 percent chromic acid removal efficiency. Completed, exportable.
Generic Profiling for Hazardous Waste	Simplified and automated database profiling system was installed for waste tracking in March 1995 at NADEP North Island. Completed, exportable.
Innotek NitRem Technology	Treatability study was conducted in September 1994; no further action is planned. Completed, not exportable.

PROJECT	STATUS
Conservation	
 Cooperative Research Agreements	Work performed under cooperative agreements is ongoing. New agreements are developed as needed. Completed, exportable.
 Burrowing Owl Education and Habitat Enhancement Program	Nest labels and information signs were erected in 1991 and 1992; owl "condominium" was constructed in 1996; monitoring of owl relocation is ongoing. Completed, exportable.
Zero Emissions/Alternative Fueled Vehicles	Three electric carts were acquired; monitored use of electric vans and carts is ongoing; continued acquisition of zero emission vehicles (ZEV) is planned. Completed, exportable.
Waterless Urinal Retro-Fit Project	Seventy-five waterless urinals were successfully installed; installation of urinals continues; success is being monitored. Completed, exportable.
Sam Houston State University Bird Eradication Technology	Technology was reviewed; no demonstration is planned. Completed, not exportable.
Pollution Prevention	
 JP-5 Fuel Recycler	Installation was completed; operational testing is underway. Staff Civil Engineering Department released an official standard operating procedure for squadron-level fuel segregation. Active.
 Integrated Pest Management (IPM) Plan	IPM plan was completed in August 1995; it is currently being implemented at NAS North Island. Completed, exportable.
 Drum Washer	Installation and implementation of a drum washer in 1996 was successful; the drum washer allows recycling of drums at reduced costs. Completed, exportable.
 Isopropyl Alcohol (IPA) Vapor Degreaser	IPA eliminated the use of ozone depleting substances (ODS) and reduced overall operation costs. Completed, exportable.
 Bio-Tech Parts Washer "SmartWasher"	Implementation of the SmartWasher at the COMNAVAIRPAC Support Equipment Rehab facility was successful; it is currently in use. Completed, exportable.
Pollution Prevention Program Development	NAS North Island is collecting performance data on FY 1995 technologies and developing FY 96 P2 equipment procurement plan. Active.
Pollution Prevention Implementation Handbook	Handbook intended to share successful P2 technologies and strategies is progress. Active.
Alternative Pier Piling Retrofit	Test plan was developed; twelve pilings were installed at Pier Bravo in April 1996; demonstration in progress. Active.

PROJECT	STATUS
Pollution Prevention (continued)	
CNG Fueling Station/Alternative Fueled Vehicles	More than 250 vehicles were converted. Two fueling stations are now in operation. Completed, exportable.
Pollution Prevention Plan Prototype	Prototype P2 plan for NAS North Island was completed and distributed to 64 activities Navy-wide. Completed, exportable.
Plastic Media Blast Booth	Replacement for chemical paint stripping implemented in July 1994 at NADEP North Island; eliminates 33,000 pounds of air pollutants and 59,000 pounds of hazardous paint waste annually. Completed, exportable.
Electrolytic Recovery Unit	System is in place at NADEP North Island to recover metals and destroy cyanide contamination in electroplating rinsewater; it may expand to a 24-hour operation in FY 1996. Completed, exportable.
Can Crusher/Compactor and Aerosol Can Puncturer	Consolidation system implemented at NADEP in 1994 reduces solid waste from 5-gallon metal cans, aerosol cans, and oil-contaminated rags by 81,330 pounds per year. Completed, exportable.
Aqueous Parts Washer	Parts washer using aqueous solution and oil/water separator reduces use of stoddard solvent at NADEP, Aircraft Intermediate Maintenance Department (AIMD), and GSE shops. Completed, exportable.

INTRODUCTION

This Navy Environmental Leadership Program (NELP) Guide provides an overview of NELP projects at Naval Air Station (NAS) North Island and serves as a reference for demonstrated innovative technologies for NELP. NELP demonstrates innovative environmental cleanup, compliance, conservation, and pollution prevention (P2) technologies and management methods. The purpose of this guide is to promote awareness and describe the status of initiatives and projects supported by the NAS North Island NELP Management Team. When a demonstrated technology shows promise, NAS North Island NELP's goal is to export Navy-wide accelerated cleanups and improve management of waste streams. The Navy encourages inquiries about the projects described in the program guide.

In this program guide, NELP projects are categorized into one of the four program pillars: environmental cleanup, compliance, conservation, and P2. Within each section, new project overviews are presented first. Project overviews are further divided into active projects, completed and exportable projects, and completed and unexportable projects. Appendix A discusses the NELP background and the NAS North Island background.

In the next version of the NELP guide, project summaries for all completed projects will be removed for inclusion in a completed project summary table.

For additional information on NELP activities at NAS North Island, contact

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or call one of the project-specific contacts listed in this Program Guide.

The NELP Guide is available via the Word Wide Web at
<http://www.nasni.navy.mil/~nelp/nelp.htm>

NELP PROJECTS

Cleanup



CAD-2 ENVIRONMENTAL MODELING SYSTEM

**Naval Air Station North Island
San Diego, California**

Mission:	Procure CAD-2 Equipment for facilities and environmental management
Contaminants:	Various
Timeframe:	1995 through 1999
Status:	Active

Synopsis

In recognition of an opportunity to satisfy facility-wide environmental data and natural resources management needs well into the next century, NAS North Island purchased Windows NT workstations under NAVFAC CAD-2 to develop a geographic information system (GIS) and facility information system (FIS). Intergraph GIS software available under CAD-2 includes the Environmental Resource Management Applications (ERMA) Data Manager, ERMA Site Geologist, and ERMA Groundwater Modeler. The software is designed for application on dual 90-MHZ Pentium TD-4 desktop workstations and takes advantage of multiprocessing and other 32-bit NT features, resulting in performance that is considerably less expensive than a full Unix CAD station.

The ERMA Data Manager provides tools for capturing, managing, mapping, and reporting two-dimensional (2-D) and three-dimensional (3-D) information for a wide range of environmental and natural resources projects. The all-in-one software integrates advanced 3-D graphics capabilities and data management tools with personal productivity tools such as word processors and spreadsheets. Environmental report production time is expected to be reduced significantly due to the simplified data access and presentation capabilities of the software.

NAS North Island is evaluating procurement of the ERMA Site Restoration Solutions (SRS) system in FY 1996. Key features of the SRS system include (1) a single, unified conceptual site model, (2) integrated data management tools, (3) consistent graphical user interfaces, (4) automatic interaction with existing ERMA software, (5) custom report generation, and (6) sophisticated 3-D visual analysis and presentation capabilities.

CAD-2 ENVIRONMENTAL MODELING SYSTEM (CONTINUED)

NAS North Island is exploring the use of an electronic tool developed by Naval Facilities Engineering Command (NAVFAC) to access activity-related data to support planning and management decisions. The tool, known as activity land and facility assets (ALFA), allows the user to analyze activity-related data and the physical attributes of a site by linking specific information organized in standard database format in ALFA to corresponding graphic elements in the CAD-2 system.

Date	Accomplishments
July 1995	CAD-2 Intergraph hardware and software was delivered.
August 1995	Intergraph implementation report was issued.

Date	Current Activities
June 1996	NAS North Island is evaluating procurement of ERMA SRS system.

Date	Horizon
FY 1996	Naval Facilities Engineering Command (NAVFAC), Southwest Division (SWDIV) will load initial data onto system, and NAS North Island staff will be trained on system.
FY 1997	ALFA databases will be populated.
FY 1997	SWDIV and NASNI will partner in order to model an Installation Restoration (IR) site.

CAD-2 ENVIRONMENTAL MODELING SYSTEM (CONTINUED)

Contacts for Further Information

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Bibliography

None available



FIFCO INTERNATIONAL, INC. BAC-TERRA IN SITU BIOAUGMENTATION DEMONSTRATION

Naval Air Station North Island
San Diego, California

Mission: Demonstrate in situ bioremediation in vadose zone soil
Contaminants: Organic compounds
Timeframe: 1994 through 1997
Status: Active

Synopsis

Through the SWDIV NT innovative technology solicitation; the Navy entered into a cost sharing contract to demonstrate Fifco's Bac-Terra bioremediation technology at NAS North Island Site 9. The demonstration will evaluate the technology's effectiveness in treating organic compounds in soil. The Bac-Terra process is an in situ bioremediation technique that combines the introduction of nutrients and microorganisms into the subsurface through injection wells. The Bac-Terra technology uses a mixture of aerobic and anaerobic microorganisms known as BR-650. The developer claims that the addition of microorganisms and nutrients to the subsurface using specialized application techniques will result in successful decomposition and degradation of petroleum hydrocarbons, volatile organic compounds (VOCs including chlorinated solvents), and semivolatile organic compounds (SVOCs) and stabilization of heavy metal salts to nondetect or below action limit levels. If effective, the Bac-Terra technology will provide a feasible and cost-effective way to remediate contaminated soil without excavation, transportation, or disposal of the soil.

Before demonstration activities can begin, a research, development, and demonstration (RD&D) permit may be required. A permit application has been submitted to DTSC, and NAS North Island is evaluating alternatives to accelerate the permitting process.

Date	Accomplishments
June 1995	Demonstration work plan was submitted by Fifco.

FIFCO INTERNATIONAL, INC.
BAC-TERRA IN SITU BIOAUGMENTATION
DEMONSTRATION (CONTINUED)

Date	Accomplishments (Continued)
September 1995	Draft quality assurance project plan was submitted by Bechtel.
January 1996	RD&D permit application was submitted by Navy for regulatory review.

Date	Current Activities
FY 1996	RD&D permit will be obtained to begin demonstration activities.

Date	Horizon
1st or 2nd Quarter FY 1997	Field demonstration will be conducted.
FY 1997	Technology will be exported if it is successful.

Contacts for Further Information

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GLOBAL ASSOCIATES CATALYST ENHANCED BIOREMEDIATION TECHNOLOGY

Naval Air Station North Island
San Diego, California

Mission: Demonstrate in situ bioremediation in vadose zone soil
Contaminants: Organic compounds
Timeframe: 1994 through 1997
Status: Active

Synopsis

Through the SWDIV NT innovative technology solicitation, the Navy entered into a cost sharing contract to demonstrate Global Associates' in situ catalyst-enhanced bioremediation process. The demonstration will be conducted at NAS North Island Site 9 to evaluate its effectiveness in remediating VOC- (including chlorinated solvents) and SVOC-contaminated soil. The in situ catalyst-enhanced bioremediation process uses indigenous bacteria in conjunction with proprietary catalysts and application techniques to accelerate remediation of organic compounds. Global Associates claims that use of the catalyst can reduce the time normally required to remediate a site by a minimum factor of 3, resulting in significant cost savings. The technology is based on the principle that existing aerobic bacteria in soils are capable of remediating contaminants, provided suitable environmental conditions can be established and maintained. Optimal bioremediation conditions are maintained by injecting oxygen and a proprietary catalyst through bioventing and biosparging wells. The bioventing and biosparging wells also allow efficient transport and distribution of oxygen and nutrients through the soil matrix, thereby maximizing the microbial population densities and greatly accelerating bioremediation of the contaminants.

Before demonstration activities can begin, an RD&D permit may be required. A permit application has been submitted to DTSC, and NAS North Island is evaluating alternatives to accelerate the permitting process.

GLOBAL ASSOCIATES CATALYST ENHANCED BIOREMEDIATION TECHNOLOGY (CONTINUED)

Date	Accomplishments
December 1995	Draft quality assurance project plan was submitted for review by Bechtel.
January 1996	RD&D permit application was submitted by Navy for regulatory review.

Date	Current Activities
FY 1996	RD&D permit will be obtained to begin demonstration activities.

Date	Horizon
1st or 2nd quarter FY 1997	Field demonstration of technology will be performed.
1997	Technology will be exported if it is successful.

Contacts for Further Information

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Bibliography

Global Environmental Associates. Research, Development, and Demonstration Permit Application for the NELP Demonstration. January 1996.



WESTERN PRODUCT RECOVERY GROUP COORDINATE CHEMICAL BONDING AND ADSORPTION DEMONSTRATION

Naval Air Station North Island
San Diego, California

Mission: Demonstrate fixation and recycling of metal contaminated soil
Contaminants: Metals
Timeframe: 1995 through 1997
Status: Active

Synopsis

A bench-scale treatability study using Western Product Recovery Group's (WPRG) Chemical Coordinate Bonding and Adsorption (CCBA) technology was conducted to evaluate the technology's ability to treat heavy metal-contaminated soil from Site 2, the Old Spanish Bite Landfill. During the treatment process, contaminated soil is heated to a high temperature and mixed with clay. The clay's silicon matrix reacts with the metals to form metal silicates, which chemically fix the metals to the final treatment product. After treatment, the soil is recovered as stable, nonleachable ceramic granules that can be reused as on-site backfill or recycled as landscaping material, road base material, or aggregate for concrete material. Air emissions generated during soil treatment are captured and treated on site before discharge to the ambient air. The technology is in the EPA's Superfund Innovative Technology Evaluation (SITE) Emerging Technologies Program and the treatability study was conducted in cooperation with EPA. A report presenting the demonstration results is being prepared.

Date	Accomplishments
1995	CCBA treatability work plan was submitted for review.
1995	250 kilograms of metals-contaminated soil from Site 2 was selected to use in the treatability study.
October 1995	A bench-scale treatability study using metals-contaminated soil from Site 2 was completed.

WESTERN PRODUCT RECOVERY GROUP

COORDINATE CHEMICAL BONDING AND ADSORPTION DEMONSTRATION (CONTINUED)

Date	Current Activities
FY 1996	Preparation of treatability study report is underway.

Date	Horizon
August 1996	Treatability study report will be submitted.
1996	A larger scale demonstration will be considered if bench-scale is successful.
1997	Technology will be exported if it is successful.

Contacts for Further Information

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Bibliography

None available



NOVOCs™ IN-WELL STRIPPING TECHNOLOGY

**Naval Air Station North Island
San Diego, California**

Mission:	In situ groundwater remediation
Contaminants:	VOCs
Timeframe:	1995 through 1997
Status:	Active

Synopsis

NAS North Island is evaluating an innovative in-well stripping technology for in situ remediation of VOC-contaminated groundwater at Site 9. The NOVOCs™ in-well stripping technology developed by EG&G Environmental (EG&G) combines the concept of an air-lift pump with in-well vapor stripping to remove VOCs from groundwater without the need to remove, discharge, or reinject a wastewater stream. NOVOCs™ can also be adapted to remove both VOCs and soluble metals from groundwater. This project is being pursued in cooperation with the EPA's Technology Innovation Office (TIO), Clean Sites, Inc., and EPA's Office of Research and Development.

The NOVOCs™ in-well stripping technology consists of a well screened beneath the water table as well as in the vadose zone. A gas line within the well runs from an above-ground gas supply and extends below the water-table. Pressurized air injected below the water-table aerates the water within the well, creating a density gradient between the aerated water and the more dense water in the surrounding aquifer. As a result, dense water flows in through the lower well screen and forces the aerated water upward within the well, while becoming aerated itself.

As the aerated groundwater rises within the well, VOC mass transfer occurs from the dissolved phase to the vapor phase. A deflector plate, above the water-table, is installed to prevent the passage of rising water or bubbles. The rising water column hits the deflector plate, the bubbles burst, and the entrained VOC vapor is stripped laterally through the screen by an upper vacuum casing. The VOC-rich vapor is brought to the surface for treatment, while the laterally-deflected water circulates back into the aquifer. Reinfiltrating water creates a toroidal circulation pattern around the well, enabling the

NOVOCs™ IN-WELL STRIPPING TECHNOLOGY (CONTINUED)

groundwater to undergo multiple treatment cycles before flowing down-gradient. The VOC-rich vapor is treated using carbon adsorption units, which will be periodically regenerated .

EG&G states that remediation of groundwater using the NOVOCs™ occurs without extracting groundwater, lowering the groundwater table, or generating wastewater typical of pump and treat systems. In addition, capital and operation and maintenance costs are claimed to be significantly less than pump and treat systems.

Before demonstration activities can begin, a research, development, and demonstration (RD&D) permit may be required. NAS North Island is evaluating alternatives to accelerate the permitting process.

Date	Accomplishments
February 1996	Work plan for NOVOCs™ demonstration is completed.

Date	Current Activities
FY 1996	Obtain RD&D permit to begin demonstration activities.

Date	Horizon
1st or 2nd Quarter FY 1997	Initiate NOVOCs™ demonstration at Site 9.
FY 1997	Export technology, if successful.

NOVOCs™ IN-WELL STRIPPING TECHNOLOGY (CONTINUED)

Contacts for Further Information

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Groundwater Remediation Technology. February 1996.



PILOT SVE/AIR SPARGING/ CATALYTIC OXIDATION SYSTEM

Naval Air Station North Island
San Diego, California

Mission:	Evaluate soil vapor treatment system. Use catalytic oxidation to treat effluent.
Contaminants:	VOCs
Timeframe:	1995 through 1997
Status:	Completed, Exportable

Synopsis

Naval Air Station (NAS) North Island completed a pilot-scale demonstration of the Terra Vac, Inc. soil vapor extraction (SVE) system at Site 11, the Industrial Waste Treatment Plant to evaluate the feasibility and effectiveness of the technology to remove VOCs from the groundwater and soil. The SVE system combined air sparging, soil vapor extraction, and catalytic oxidation (CATOX) technologies to destroy contaminants.

For the pilot test, an array of two air injection and six extraction wells were installed. The wells were connected by manifold piping to an air compressor and blower to provide pressure for sparging and vacuum for extraction. The air injection wells, which were screened in the upper portion of the saturated zone, were used to remediate groundwater by injecting air under pressure to sparge the groundwater. During sparging, air released into the saturated zone causes bubbles to form, which allows VOCs in the groundwater to diffuse into the rising bubbles. When the bubbles reach the vadose zone, the contaminants are removed via vapor extraction wells installed in the unsaturated zone. The location and distribution of sparging and extraction wells are determined on a site-specific basis. The extraction wells are connected to a liquid-gas separator, where any liquid is removed. Once liquids are removed, the air effluent is treated using a CATOX unit, which consists of a catalyst especially designed to oxidize VOCs into carbon dioxide and water vapor. The CATOX unit has a demonstrated destruction efficiency of 99 percent. Operation and construction of the CATOX unit required a permit from the San Diego County Air Pollution Control District.

PILOT SVE/AIR SPARGING/ CATALYTIC OXIDATION SYSTEM (CONTINUED)

During the pilot study, up to 250 pounds (33 gallons) per day of VOCs was effectively removed from the vadose zone at Site 11 and subsequently destroyed using the CATOX unit. The results indicated that the soils and contaminant mass distribution were amenable to remediation using this technology. Based on the results of the pilot-scale study, a full-scale SVE system was designed to remediate groundwater and vadose zone contamination at Site 9, the Chemical Waste Disposal Area, and at Site 11. However, vapor-phase carbon adsorption was selected for off-gas treatment. Construction of SVE systems at these sites is currently underway.

Date	Accomplishments
June 1995	Work plan for SVE pilot test completed.
1995	Pilot test implemented.
1996	Pilot test report completed.

Date	Current Activities
June 1996	Construction is underway for full-scale implementation of the SVE system at Sites 9 and 11.

Date	Horizon
FY 1996 to FY 1997	SVE removal action will proceed for Sites 9 and 11.

Contacts for Further Information

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PILOT SVE/AIR SPARGING/

CATALYTIC OXIDATION SYSTEM (CONTINUED)

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Science Application International Corporation. Work Plan for the Phase II Soil Vapor Extraction Pilot Test. June 1995.



SITE 9 OFFSHORE SAMPLING FOR VOCs

**Naval Air Station North Island
San Diego, California**

Mission:	Assess the potential migration of contaminants into the San Diego Bay
Contaminants:	VOCs
Timeframe:	March 1995 through December 1996
Status:	Completed, Exportable

Synopsis

NAS North Island demonstrated the PETREX passive soil vapor survey technique at Site 9 to delineate chlorinated VOC migration pathways in the groundwater and possible discharges into San Diego Bay. The PETREX sampling technique is a remote sensing, near-surface screening method that directly collects and identifies in one analysis, a large range of chlorinated, aliphatic, and aromatic contaminant vapors migrating to the surface from the soil or groundwater beneath each collection point. PETREX surveys provide rapid reconnaissance screening of soils and groundwater for VOCs and semi-volatile organic compounds (SVOC) and can be used to establish the extent of contamination at a site and to guide well placement and soil boring programs. By screening suspected groundwater migration pathways using PETREX samplers, NAS North Island was able to focus confirmation drilling and sampling activities on known areas of contamination, thereby, substantially reducing the overall cost of the investigation.

The PETREX samplers provided by Northeast Research Institute (NRI) consist of two ferromagnetic wire collectors. Each collector is coated with an activated carbon sorbent and housed in a resealable glass vial. At Site 9, samplers were laid out in a grid that covered onshore and offshore portions of areas of concern. PETREX sampling tubes were emplaced onshore in fill material and offshore by commercial divers in sediments beneath 10 to 55 feet of water. Samplers were installed about 16 inches below the surface and left in place for just over 2 weeks. This time integrative collection period provides PETREX with the capability to collect and identify lower levels of less volatile compounds at greater depths through tighter soil conditions.

SITE 9 OFFSHORE SAMPLING FOR VOCs (CONTINUED)

After collection, samples were shipped to NRI's laboratory for analysis using mass spectrometry. The results obtained from the PETREX samplers are reported in ion flux counts, rather than concentrations, because of the time-integrative nature of the sample collection method. Flux counts are related to concentrations, but cannot be extrapolated directly.

Results of the survey at Site 9 showed that contaminants in the groundwater are discharging in low concentrations to the San Diego Bay and are being reduced from highly chlorinated, toxic forms to less chlorinated, less toxic forms. In addition to defining low-concentration migration pathways, the data also helped to confirm the conceptual site model.

Date	Accomplishments
June 1995	Shoreline monitoring wells were resampled, and extended groundwater modeling was completed.
September 1995	PETREX samplers were retrieved and verification samples were collected.
October 1995	Collected samples were analyzed.
February 1996	Report detailing the findings of the PETREX survey was submitted.

Date	Current Activities
June 1996	Site 9 offshore sampling for VOCs fact sheet is in preparation.

Date	Horizon
July 1996	Fact sheet for Site 9 offshore sampling will be completed; technology will be exported.

SITE 9 OFFSHORE SAMPLING FOR VOCs (CONTINUED)

Contacts for Further Information

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Jacobs Engineering, Inc. Draft Addendum to RI/RFI Report, Site 9, Chemical Waste Disposal Area, Naval Air Station North Island. April 1996.



ENVIRO-CORE CONTINUOUS SOIL CORE SAMPLER

Naval Air Station North Island
San Diego, California

Mission: Obtain continuous soil cores in unconsolidated sediment
Contaminants: Various
Timeframe: 1994 through 1995
Status: Completed, Exportable

Synopsis

The Enviro-Core sampling system developed by Precision Sampling, Inc. (PSI) was demonstrated to evaluate the technology's effectiveness in collecting continuous soil cores, soil gas samples, and groundwater samples in unconsolidated sediments at NAS North Island, Site 9. The Enviro-Core system consists of a dual-wall rod and core barrel that are simultaneously pushed, driven, or vibrated into the ground. The system is capable of collecting 3-foot long continuous soil cores inside the 1 5/8-inch diameter core barrel. The cores are collected in stainless steel liners inside the inner sample barrel and are retrieved by wireline. During sample collection the drive casing is left in place and serves as temporary casing to prevent the borehole from collapsing. The drive casing also prevents vertical cross-contamination, ensures that the core barrel collects representative samples rather than slough, and allows depth-discrete groundwater sampling with a 3/4 inch diameter bailer.

The Enviro-Core system claims to offer a quick and cost effective alternative to traditional drilling techniques. Because no drill cuttings are generated which eliminates the costs of waste management, treatment, and disposal.

Date	Accomplishments
March 1994	Field demonstration was conducted at Site 9.
FY 1995 and FY 1996	Enviro-Core system was used to collect soil and groundwater samples at Site 2, 5, and 7.

ENVIRO-CORE CONTINUOUS SOIL CORE SAMPLER (CONTINUED)

Date	Horizon
FY 1997	Technology transfer activities will continue.

Contacts for Further Information

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Vendor Brochure, Precision Sampling, Inc.



NOVATERRA IN SITU STABILIZATION/ SOLIDIFICATION PILOT STUDY

**Naval Air Station North Island
San Diego, California**

Mission: Demonstrate applicability of technology
Contaminants: Metals, VOCs, and SVOCs
Timeframe: 1994 through 1997
Status: Active

Synopsis

Through the SWDIV NT innovative technology solicitation, the Navy entered into a cost-sharing contract to conduct a pilot-scale demonstration of the NovaTerra in situ stabilization/solidification technology at NAS North Island Site 11. The demonstration would evaluate the technology's ability to treat soil containing high levels of metals, VOCs, and SVOCs. The NovaTerra technology consists of a mobile, dual auger system that simultaneously injects and mixes chemical reagents and cementaceous slurry into the subsurface. During treatment, contaminants are chemically bound and immobilized by the cement. The developer claims that the NovaTerra system effectively treats a wide range of organic and inorganic contaminants, cleans soil quickly, and eliminates the costly requirement of excavation, transportation, and disposal of contaminated material. The technology also has the capability to capture and treat gases that may be emitted from the stabilization process.

The NovaTerra technology has been purchased by Severson. The Navy is awaiting negotiation with the new technology owner to determine if the project should proceed.

Date	Accomplishments
1996	Awaiting contract negotiation with new technology owner. Draft work plan submitted for Navy review.

NOVATERRA IN SITU STABILIZATION/ SOLIDIFICATION PILOT STUDY (CONTINUED)

Contacts for Further Information

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TERRA-KLEEN SOIL WASHING TECHNOLOGY AND REMOVAL ACTION ACTIVITIES AT SITES 4, 6, AND 10

Naval Air Station North Island

Mission:	Remediation of PCB-Contaminated Soil
Contaminants:	PCBs
Timeframe:	August 1993 through December 1996
Status:	Completed, Exportable

Synopsis

Terra-Kleen Response Group, Inc. has developed a soil washing system to remove semivolatile and nonvolatile organic contaminants, including polychlorinated biphenyls (PCB) from soil. The Terra-Kleen soil washing system is a batch process that uses a proprietary solvent to remove contaminants from soils, sediments, sludge, and debris. The resulting PCB-laden solvent is passed through a purification unit to remove PCBs. Cleaned solvent is reused to wash more contaminated soil, and the PCB-contaminated purification medium is transported off site for incineration.

A field-scale treatability demonstration conducted at IR Site 4, Public Works Salvage Yard, NAS North Island, successfully reduced PCB levels in soil from 144 to 1.7 milligrams per kilogram (mg/kg) on average. The \$500,000 cost of the demonstration was shared by the Navy and the EPA SITE Program. The Navy portion was \$50,000; the EPA SITE Program contributed \$450,000.

Due to the success of the demonstration, this technology was selected to remediate PCB-contaminated soils as part of a time-critical removal action at NAS North Island Sites 4, 6, and 10. Soils containing PCBs at levels greater than 0.066 parts per million (ppm) have been excavated, and soils with PCB concentrations above 25 ppm are being treated using the Terra-Kleen process. Treated and untreated soil (less than 25 ppm of PCBs) will be used as engineered fill soil and capped at Site 4. Remediation is scheduled for completion in September 1996. The use of this innovative technology is estimated to save the Navy more than \$5,000,000 in treatment costs on this project compared to the cost of off-site incineration.

TERRA-KLEEN SOIL WASHING TECHNOLOGY AND REMOVAL ACTION ACTIVITIES AT SITES 4, 6, AND 10 (CONTINUED)

Based on work primarily conducted at NAS North Island, Terra-Kleen applied for and received a Toxic Substances Control Act (TSCA) operating permit from EPA. The TSCA permit replaces the need for an operating permit and allows operation at any location in California.

Date	Accomplishments
October through November 1993	EPA conducted a 2-ton treatability study using soil from NAS North Island Site 4. PCB concentrations were reduced from about 460 mg/kg to 2 mg/kg.
November 19, 1993	EPA requested that NAS North Island participate in a field-scale demonstration of Terra-Kleen's soil washing technology.
April 8, 1994	A fact sheet on the Terra-Kleen technology demonstration was distributed.
May 2, 1994	Regulators approved the Terra-Kleen Resource Conservation and Recovery Act (RCRA) variance allowing field demonstration.
May through June 1994	The Terra-Kleen soil washing technology completed demonstration activities at Site 4, near Building 661. The study lasted 8 weeks. PCB concentrations in soil were reduced on average from 144 to 1.7 mg/kg.
May 24 and 25, 1994	Media and visitors' days were held for community, regulators, and Navy personnel to view the treatability study. In addition, a demonstration video was taped. About 80 individuals viewed the demonstration.
July 1994	Removal action documents for Sites 4, 6, and 10 submitted for regulatory review.
August 1994	EPA issued a Technology Demonstration Bulletin to publicize preliminary demonstration results. Regulatory and public comments on removal action documents were received.
October 1994	Draft final removal action documents were issued for regulatory and public comment.
January 1995	NELP fact sheet was published.
May 1996	Terra-Kleen received a TSCA certification.

TERRA-KLEEN SOIL WASHING TECHNOLOGY AND REMOVAL ACTION ACTIVITIES AT SITES 4, 6, AND 10 (CONTINUED)

Date	Current Activities
May 1995 to September 1996	Terra-Kleen technology is implemented for time-critical removal actions at Sites 4, 6, and 10.

Date	Horizon
August 1996	EPA will publish a Technology Evaluation Report.
September 1996	Time-critical removal action will be completed.
December 1996	Final removal action report will be submitted.
FY 1998	Preparation of no further remedial action record of decision for Sites 4 & 6.

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TERRA-KLEEN SOIL WASHING TECHNOLOGY AND REMOVAL ACTION ACTIVITIES AT SITES 4, 6, AND 10 (CONTINUED)

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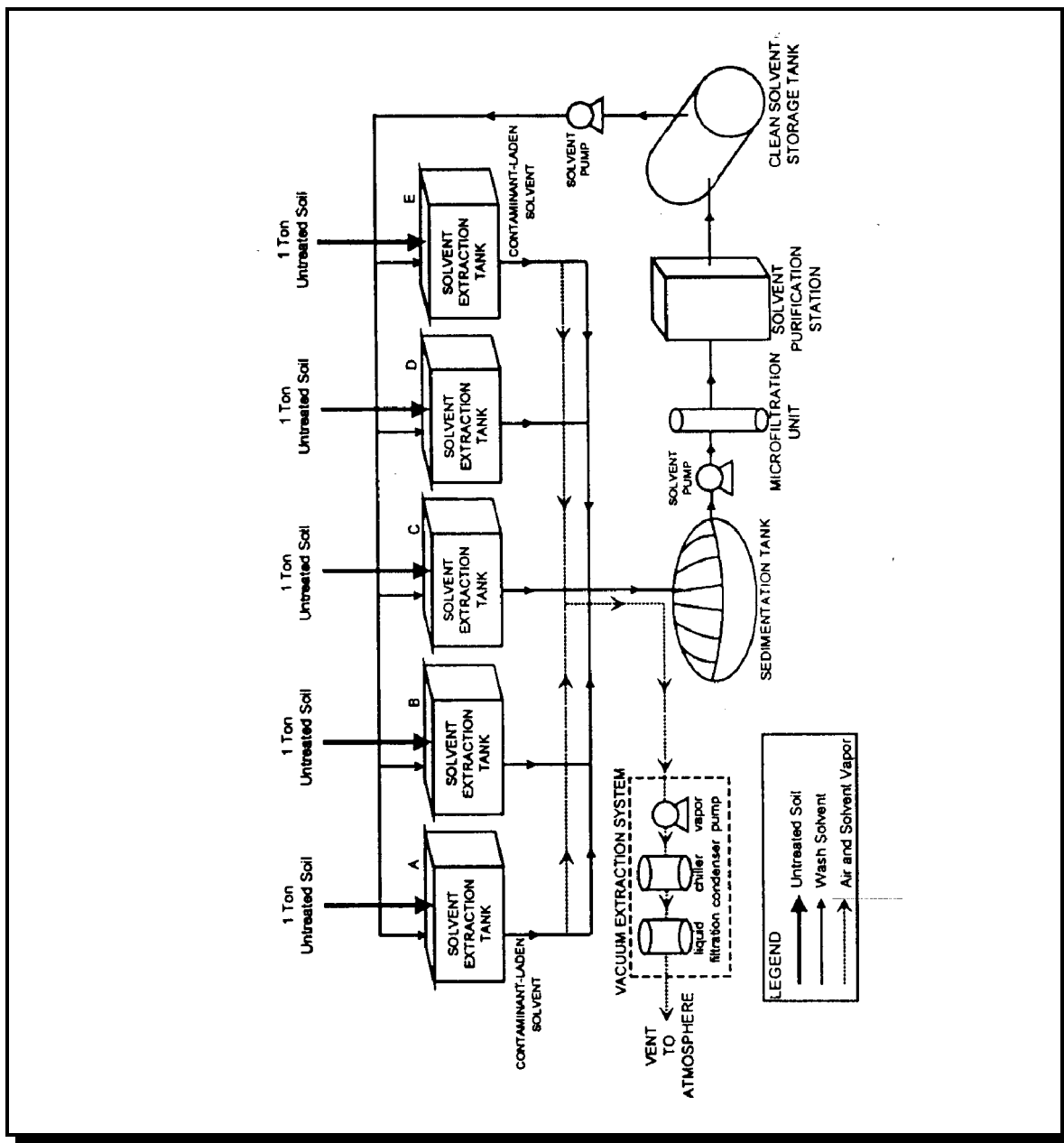
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TERRA-KLEEN SOIL WASHING TECHNOLOGY AND REMOVAL ACTION ACTIVITIES AT SITES 4, 6, AND 10 (CONTINUED)



Terra-Kleen Soil Washing Process

ZENON PERVAPORATION TECHNOLOGY

Naval Air Station North Island
San Diego, California

Mission: Remediate contaminated groundwater
Contaminants: Volatile organic compounds
Timeframe: November 1993 through March 1995
Status: Completed, Exportable

Synopsis

The Navy evaluated a cross-flow pervaporation system developed by Zenon Environmental, Inc. The Zenon technology, using a membrane process, removes dissolved VOCs and some SVOCs from contaminated groundwater. The technology was demonstrated at NAS North Island Site 9 under the EPA SITE Program during February 1995.

During the demonstration, about 65,000 gallons of contaminated groundwater from Site 9 was pumped from a series of monitoring wells and treated by the Zenon pervaporation system. Samples of untreated and treated water were collected and analyzed by EPA's SITE team to assess the performance of the technology. Preliminary results indicate that the Zenon technology was successful in removing trichloroethylene (TCE) from contaminated groundwater at a 99 percent removal efficiency (TCE concentrations were reduced on average from 200 milligrams per liter [mg/L] to less than 2 mg/L). The treated effluent was polished using activated carbon before it was discharged to the sewer. The Zenon technology has the potential for significantly reducing the amount of activated carbon required to treat contaminated groundwater and the remediation costs.

The Navy shared the costs of conducting the field-scale demonstration with the EPA SITE Program. The total cost of the demonstration was about \$623,000, of which the Navy funded \$90,000, the EPA SITE Program funded \$370,000, and Zenon funded \$163,000. Based on the demonstration results, Zenon estimates treatment costs to range from \$2.00 to \$4.00 per 1,000 gallons of contaminated water, which represents a significant cost savings over traditional treatment systems.

ZENON PERVAPORATION TECHNOLOGY (CONTINUED)

Date	Accomplishments
November 9, 1993	EPA asked NAS North Island to participate in the SITE Program to demonstrate Zenon's pervaporation system.
November 30, 1993	EPA collected a 10-gallon groundwater sample from Site 9 for a bench-scale study to evaluate the Zenon technology.
July 10, 1994	Zenon fact sheet for the technology demonstration was issued.
September through October 1994	Zenon mobilized equipment at Site 9 to conduct the demonstration.
November 1 and 2, 1994	Media and visitors' days were held for Zenon treatability study.
February 1995	EPA conducted demonstration activities involving untreated and treated groundwater sampling and air sampling.
June 1995	Zenon demonstration bulletin was issued.
August 1995	Zenon demonstration capsule was issued.

Date	Horizon
August 1996	The final Zenon technology evaluation report will be issued.

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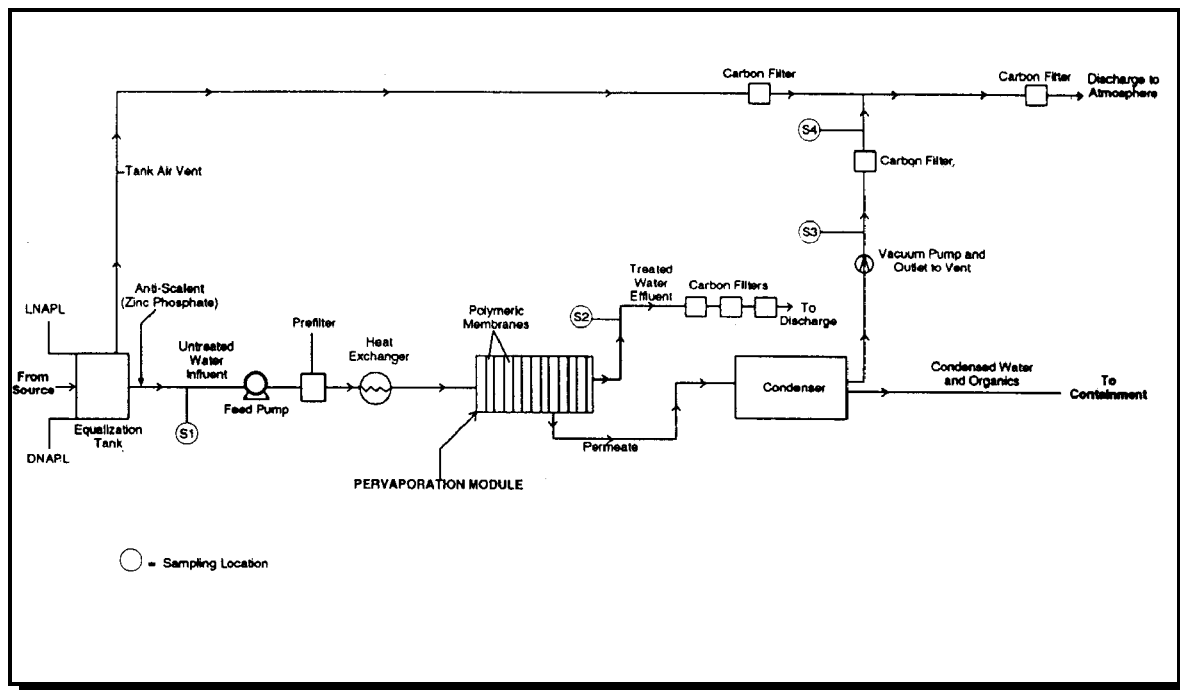
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Ron Turner / EPA / (513) 569-7775

ZENON PERVAPORATION TECHNOLOGY (CONTINUED)

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Zenon Pervaporation Technology

BIOREMEDIATION TREATMENT FACILITY

Public Works Center San Diego

Mission: On-site bioremediation of contaminated soils
Contaminants: Petroleum hydrocarbons
Timeframe: March 1994 through August 1996
Status: Completed, Exportable

Synopsis

PWC San Diego has designed and constructed a Bioremediation Treatment Facility (BTF) at NAS North Island to bioremediate petroleum hydrocarbon-contaminated soils using a vented biopile technique. This technique uses electric blowers to pull fresh air through contaminated soil piles to enhance aerobic biodegradation. Effluent vapors are treated with vapor-phase activated carbon. In addition, an application system is present that dispenses nutrients to the biopile.

The BTF received a Class II Designated Waste Facility permit, which allows the treatment of petroleum contaminated soils from NAS North Island, Naval Amphibious Base (NAB) Coronado, and Naval Outlying Field (NOLF) Imperial Beach. The BTF was constructed with double liners and a leachate collection system to enable future treatment of the RCRA hazardous wastes. A RCRA Part B permit will be required to treat hazardous wastes. Initially, the BTF will be used only to bioremediate petroleum hydrocarbon-contaminated soils (designated wastes) generated at underground storage tank (UST) and installation restoration (IR) sites.

On-site treatment of contaminated soil will significantly reduce the cost of cleaning sites at NAS North Island. For example, for a typical petroleum UST site that generates 1,000 tons of contaminated soil, treatment at the BTF will save about \$30,000 as compared to thermal desorption or soil washing at local facilities and more than \$100,000 as compared to disposal at an off-site Class II landfill.

BIOREMEDIATION TREATMENT FACILITY (CONTINUED)

Date	Accomplishments
December 1994	Class II Designated Waste Facility permit application was submitted. BTF construction was initiated.
February 1996	Permit was received to treat soil from NAS North Island NAB Coronado, and NOLF Imperial Beach. Construction of BTF and bioremediation of petroleum hydrocarbon-contaminated soil began.
May 1996	BTF became operational.

Date	Current Activities
June 1996	BTF is treating petroleum hydrocarbon-contaminated soil

Date	Horizon
1996	BTF successes will be exported.

Contacts for Further Information

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Bibliography

None available

2-D AND 3-D HIGH-RESOLUTION SEISMIC REFLECTION SURVEYS

Naval Air Station North Island San Diego, California

Mission:	Characterize subsurface geology to determine contaminant migration pathways and contaminant hotspots
Contaminants:	Dense non-aqueous phase liquids (DNAPL) and chlorinated solvents
Timeframe:	January 1994 through May 1995
Status:	Completed, Exportable

Synopsis

Resolution Resources, Inc. (RRI) completed innovative site characterization of Site 9 using 2 dimensional (2-D) and 3 dimensional (3-D) high-resolution seismic imaging surveys. The technology uses the principles of seismic refraction and reflection to map subsurface lithology. The use of seismic imaging surveys can provide a better understanding of heterogeneous subsurface geology and allow more effective placement of wells for contaminant delineation and remediation, thus reducing overall project costs. The data from the seismic surveys were correlated with data collected from cone penetrometer tests, mud rotary borings, and hollow-stem auger borings to create an image of the subsurface lithology. An example of a 3-D seismic image is shown on the attached figure.

At Site 9, DNAPLs have migrated through about 10 feet of vadose zone soils into the underlying saturated zone. The seismic and drilling data indicated that a discontinuous clay layer was present at a depth of 35 feet below ground surface (bgs) and that a continuous clay layer was present at 114 feet bgs. One purpose of the seismic surveys was to locate depressions in the continuous clay layer where DNAPLs may have collected and pooled. Wells could then be drilled into the DNAPL pools to allow removal of free DNAPLs. The seismic data, however, indicated that the clay layer may be breached by faults and may not collect DNAPLs.

To determine if DNAPL pools were present, temporary wells were drilled into three depressed areas in the continuous clay layer identified by the seismic data. These areas were thought to be the most likely areas for DNAPLs to collect if fracturing was not too extensive. However, free product was not found

2-D AND 3-D HIGH-RESOLUTION SEISMIC REFLECTION SURVEYS (CONTINUED)

in any of the wells. It was concluded that the clay layer was, indeed, too fractured and faulted to hold DNAPLs, as was indicated by the seismic data.

The cost to implement 2-D and 3-D high-resolution seismic survey at NAS North Island was about \$250,000. This included a literature review, fracture trace analysis, 2-D and 3-D data collection and processing, data interpretation, and reporting. Based on the estimated cost of the original Navy characterization plan that called for 600 borings on a grid over the 40-acre site, NAS North Island estimates that use of 2-D and 3-D surveys saved the Navy several million dollars in characterization costs and will save millions of dollars more in reduced remediation costs.

In addition to characterization activities at Site 9, a 2-D base-wide seismic reflection survey was completed. This technology has been successfully exported to NAS Alameda, where it is currently being demonstrated under the Office of the Deputy Under Secretary of Defense Environmental Security's (ODUSD(ES)) Technology Certification Program. The object of the demonstration is to verify the technology's ability to image DNAPL in the subsurface.

Date	Accomplishments
January 1994	2-D survey was completed.
August 1994	3-D survey was completed.
December 1994	Site 9 characterization was conducted.
February 1995	Base-wide 2-D survey data were processed by RRI.
March 1995	Final report was submitted.

Date	Horizon
July 1996	A fact sheet will be developed.

2-D AND 3-D HIGH-RESOLUTION SEISMIC REFLECTION SURVEYS (CONTINUED)

Contacts for Further Information

Bill Collins / SWDIV / (615) 532-2337

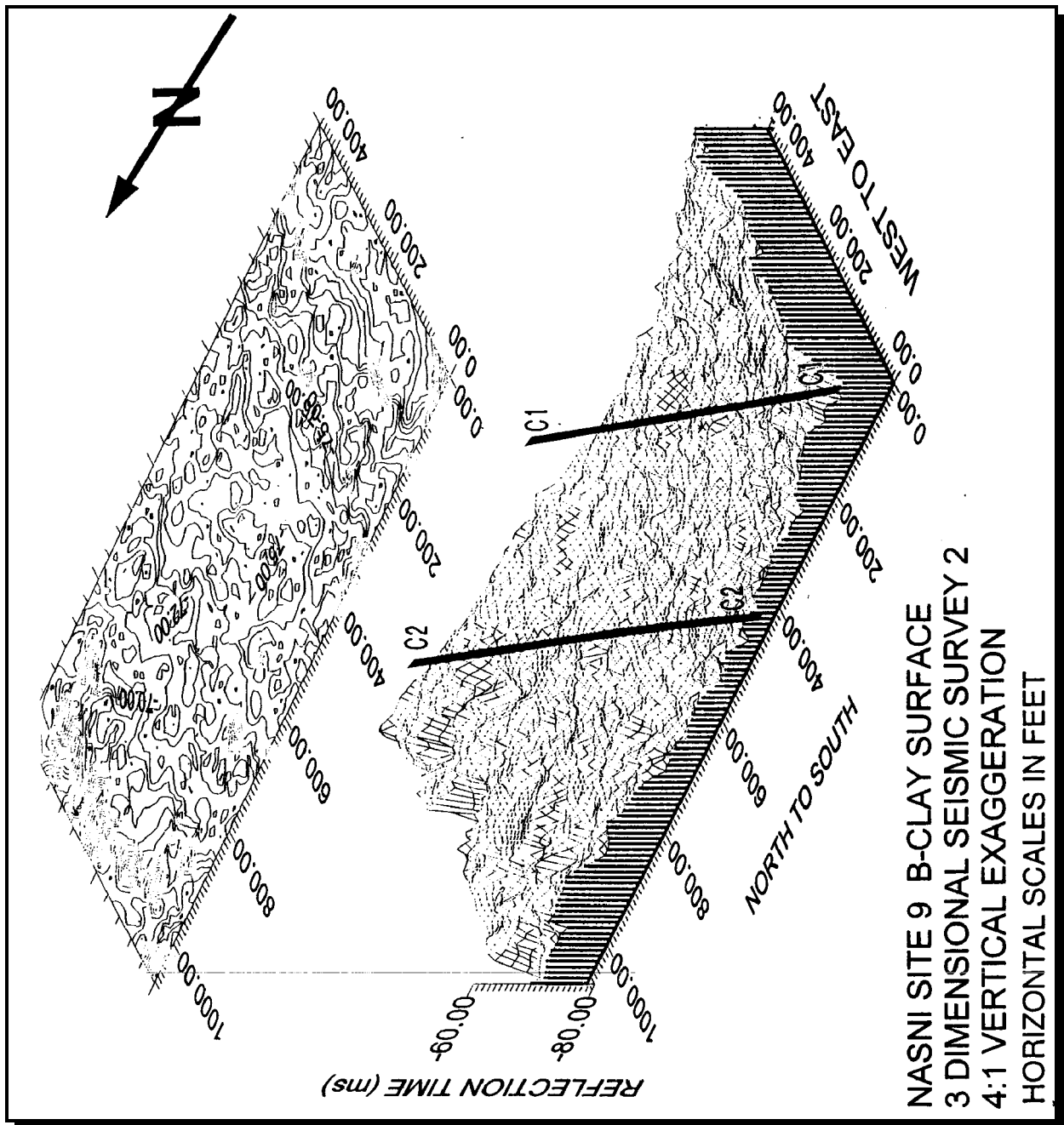
Mary-Linda Adams, Brian Herridge / RRI / (612) 824-3234 or (517) 647-1832

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Jacobs Engineering Group, Inc. Remedial Investigation/RCRA Facility Investigation Report, Site 9, Naval Air Station North Island, October 1995.

2-D AND 3-D HIGH-RESOLUTION SEISMIC REFLECTION SURVEYS (CONTINUED)



Example of 3-D Seismic Image

SITE CHARACTERIZATION AND ANALYSIS PENETROMETER SYSTEM

NCCOSC RDT&E Division
San Diego, California

Mission:	Rapid field screening and delineation of subsurface contamination
Contaminants:	Petroleum hydrocarbons and chlorinated solvents
Timeframe:	Ongoing
Status:	Completed, Exportable

Synopsis

The Naval Command, Control and Ocean Surveillance Center (NCCOSC) Research, Development, Test, and Evaluation (RDT&E) Division has developed a fiber-optic sensor apparatus integrated with a cone penetrometer called the Site Characterization and Analysis Penetrometer System (SCAPS). SCAPS, equipped with a laser-induced fluorescence (LIF) sensor, is capable of providing real-time measurement of petroleum products in situ using laser-induced fluorescence. NCCOSC RDT&E Division is also developing new SCAPS sensors that will detect chlorinated solvents, metals, and other contaminants.

NCCOSC RDT&E Division demonstrated the SCAPS LIF system at the NAS North Island Fuel Farm in August 1993 and at a leaking UST site in July 1994. The NCCOSC RDT&E Division demonstrations at NAS North Island have successfully correlated SCAPS data using confirmation soil borings. SCAPS was successfully used to delineate soil contamination for an expedited UST closure at NAS North Island.

NCCOSC RDT&E Division conducted initial field trials of the Raman Spectroscopy chlorinated solvent detection system on a SCAPS platform in July 1995 at the NAS North Island Fuel Farm and Site 9. The field trial data are currently being evaluated.

Based on demonstration activities conducted at NFESC Port Hueneme and Sandia National Laboratory, the SCAPS equipped with LIF was successfully verified by EPA in February 1996 and received certification from Cal EPA as a field screening technology for the real-time detection of petroleum hydrocarbons in the subsurface, both above and below the groundwater table in March 1996.

SITE CHARACTERIZATION AND ANALYSIS PENETROMETER SYSTEM (CONTINUED)

SCAPS LIF has also gained regulatory acceptance from the states of Louisiana, New Jersey, Utah, Nebraska, and Idaho. SCAPS has been successfully exported, and units are currently in operation at both PWC San Diego, California and PWC Jacksonville, Florida.

By using SCAPS, NFESC estimates that the Navy will realize a savings of more than 30 percent on the cost of site assessments at typical petroleum UST sites. Compared to the cost of using traditional site assessment methods, such as hollow-stem auger drill rigs, SCAPS could save the Navy at least \$2,000 per site assessment.

Date	Accomplishments
August 1993 to October 1993	SCAPS was demonstrated at the NAS North Island Fuel Farm Area.
July 1994	SCAPS demonstration at NAS North Island (as part of an expedited UST closure) was conducted.
November to December 1994	Shakedown was conducted of SCAPS Unit Engineering Design Module (EDM)-2 at NAS North Island Fuel Farm. Data from shakedown operations were used to assist NAS North Island and remediation contractors in developing the final remedial design for a free product recovery system.
June 1995	NCCOSC RDT&E Division used SCAPS at the fuel farm to complete light nonaqueous phase liquid (LNAPL) delineation.
FY 1995	SCAPS was exported successfully through NFESC to PWC San Diego and Jacksonville.
July 1995	NCCOSC RDT&E Division performed initial tests of the Raman chlorinated solvent detection system at Site 9.
February 1996	SCAPS LIF was verified successfully by EPA
March 1996	SCAPS LIF received certification for field screening of petroleum hydrocarbons from Cal EPA.

SITE CHARACTERIZATION AND ANALYSIS PENETROMETER SYSTEM (CONTINUED)

Date	Horizon
FY 1997	NCCOSC RDT&E Division may test SCAPS laser-induced breakdown spectroscopy (LIBS) sensor at metal-contaminated sites at NAS North Island.
FY 1997	NCCOSC RDT&E Division may test SCAPS microchip LIF sensor at gasoline- and benzene, toluene, ethylbenzene, and xylene (BTEX)-contaminated sites at NAS North Island.

Contacts for Further Information

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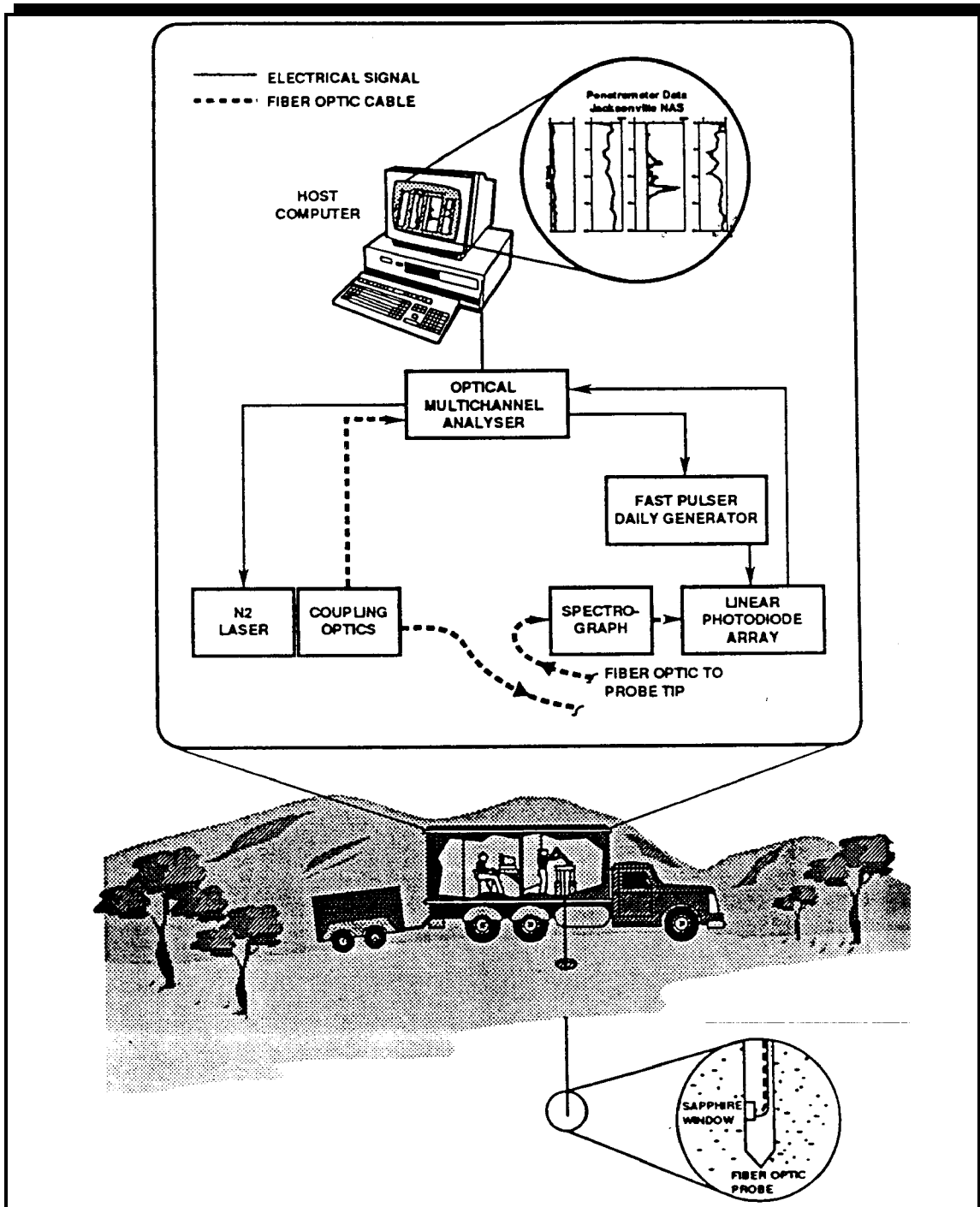
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SITE CHARACTERIZATION AND ANALYSIS PENETROMETER SYSTEM (CONTINUED)



Cone Penetrometer Fiber Optic Fluorometer (Double Filter System)

EXPEDITED UST CLOSURE

Naval Air Station North Island San Diego, California

Mission:	Obtain closure of a leaking UST site in the shortest practicable time
Contaminants:	Petroleum hydrocarbons
Timeframe:	May through October 1994
Status:	Completed, Exportable

Synopsis

NAS North Island completed an expedited characterization, removal, and remediation project for regulatory site closure for an UST site. A cooperative effort facilitated this project and included NAS North Island, SWDIV, NCCOSC RDT&E Division, PWC UST removal teams, regulatory agencies, and contractors. This process, which normally requires up to 5 years, was completed and site closure was requested in less than 100 days.

Before the UST was removed, SCAPS was used to delineate the extent of soil contamination adjacent to a petroleum UST located at Building 489. The SCAPS work indicated that the extent of soil contamination was limited; therefore, a work plan was prepared for overexcavation of contaminated soil at the time of UST removal. PWC removed the UST and excavated contaminated soil. About 200 cubic yards of contaminated soil was transported to a local thermal desorption facility for treatment. The treated soil was hauled back to the site and used to backfill the UST excavation. No further action is required by the regulatory agencies at this site.

Approximate costs for the expedited UST closure were as follows:

- UST removal and soil excavation cost \$69,000
- Shoring (due to proximity to an aircraft taxiway) cost \$75,000
- Geological interpretations, soil sampling, oversight, planning, reporting, field work, and analyses cost \$80,000
- Contaminated soil transportation and treatment cost \$12,000

EXPEDITED UST CLOSURE (CONTINUED)

Date	Accomplishments
July 1994	Representatives of the County of San Diego Hazardous Materials Management Division (HMMD), Regional Water Quality Control Board (RWQCB), PWC, NAS North Island, and NCCOSC met to discuss the planned events.
	A work plan was approved by the County of San Diego.
	NCCOSC mobilized SCAPS to delineate the extent of contaminated soil.
August 1994	PWC removed Tank 489, a 4,000-gallon fiberglass tank.
September 1994	Fifteen soil borings were advanced to set I-beams used to shore the excavation due to proximity to a taxiway and a building. Excavation of contaminated soil conducted.
October to November 1994	Soil containing diesel concentrations above the regulatory action level of 1,000 mg/kg was transported to Shewey Environmental Remediation Facility in San Diego for treatment using thermal desorption. The treated soil was returned to NAS North Island on November 1, 1994, and used to backfill the excavation.
January 1995	An assessment and mitigation report for Building 489, Tank 489 was finalized and delivered.
March 1995	A draft fact sheet was submitted.
November 1995	A letter recommending no further action for Building 489, Tank 489 was received from San Diego County SAM Division.
February 1996	Site closure letter was received from HMMD.

Date	Horizon
1996	Final fact sheet will be completed.

Contacts for Further Information

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Thomas W. Hampton / NCCOSC RDT&E Division / (619) 553-1172

EXPEDITED UST CLOSURE (CONTINUED)

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DEMONSTRATION PERMITTING PROCEDURES FLOWCHARTS

Naval Air Station North Island San Diego, California

Mission: Provide guidance on permitting and variance procedures for cleanup demonstrations and treatability studies

Contaminants: Various

Timeframe: February 1995

Status: Completed, Exportable

Synopsis

Regulatory permitting and variance procedures flowcharts for innovative remediation technology treatability studies and field demonstrations were prepared for NAS North Island. Separate flowcharts were prepared for each of the six regulatory agencies involved in site remediation. These were EPA; DTSC; Cal EPA RWQCB; San Diego County Department of Environmental Health, Site Assessment and Mitigation Division (SAM); San Diego County Air Pollution Control District (APCD); and the City of San Diego Metropolitan Sewerage System, Industrial Waste Program. The flowcharts will guide Navy program managers and contractors through the regulatory permitting and variance process, saving time and money.

Date	Accomplishments
February 1995	Flowcharts were delivered to the Navy.

Contacts for Further Information

Mike Magee / NAS North Island / (619) 545-2709

DEMONSTRATION PERMITTING

PROCEDURES FLOWCHARTS (CONTINUED)

Bibliography

PRC Environmental Management, Inc. Regulatory Response Manual. Procedures Flowcharts for Innovative Remediation Technology Management, Inc. Treatability Studies and Field Demonstrations. February 1, 1995.

HVEA ELECTRON BEAM TECHNOLOGY

Naval Air Station North Island San Diego, California

Mission: Remediate contaminated groundwater
Contaminants: Volatile organic compounds
Timeframe: August 1994 through January 1997
Status: Completed, not exportable

Synopsis

The Navy evaluated the electron beam technology for its effectiveness in treating chlorinated hydrocarbon-contaminated groundwater from NAS North Island Site 9. The technology, developed by High Voltage Environmental Applications, Inc. (HVEA), irradiates water with a beam of high-energy electrons causing the formation of aqueous electrons, hydroxyl radicals, and hydrogen radicals. These species destroy organic compounds in water. This treatment technology does not generate waste residuals.

At no cost to the Navy, HVEA conducted a bench-scale treatability study on groundwater from Site 9. The groundwater contained a floating hydrocarbon layer in addition to TCE contamination. During the tests, it was determined that the hydrocarbons were interfering with destruction of TCE by the electron beam. Therefore, use of the electron beam technology as a stand-alone technology to treat Site 9 groundwater was deemed not feasible, and the study was discontinued. HVEA spent about \$5,000 for groundwater sampling and analysis, project oversight, and report preparation. NAS North Island is not considering the HVEA system for use at other sites.

Date	Accomplishments
August 1994	A work plan for the treatability study was approved by the Navy.
September 1994	A treatability study was conducted.
January 1995	A report documenting the results of the study was prepared and submitted to the Navy.

HVEA ELECTRON BEAM TECHNOLOGY (CONTINUED)

Contacts for Further Information

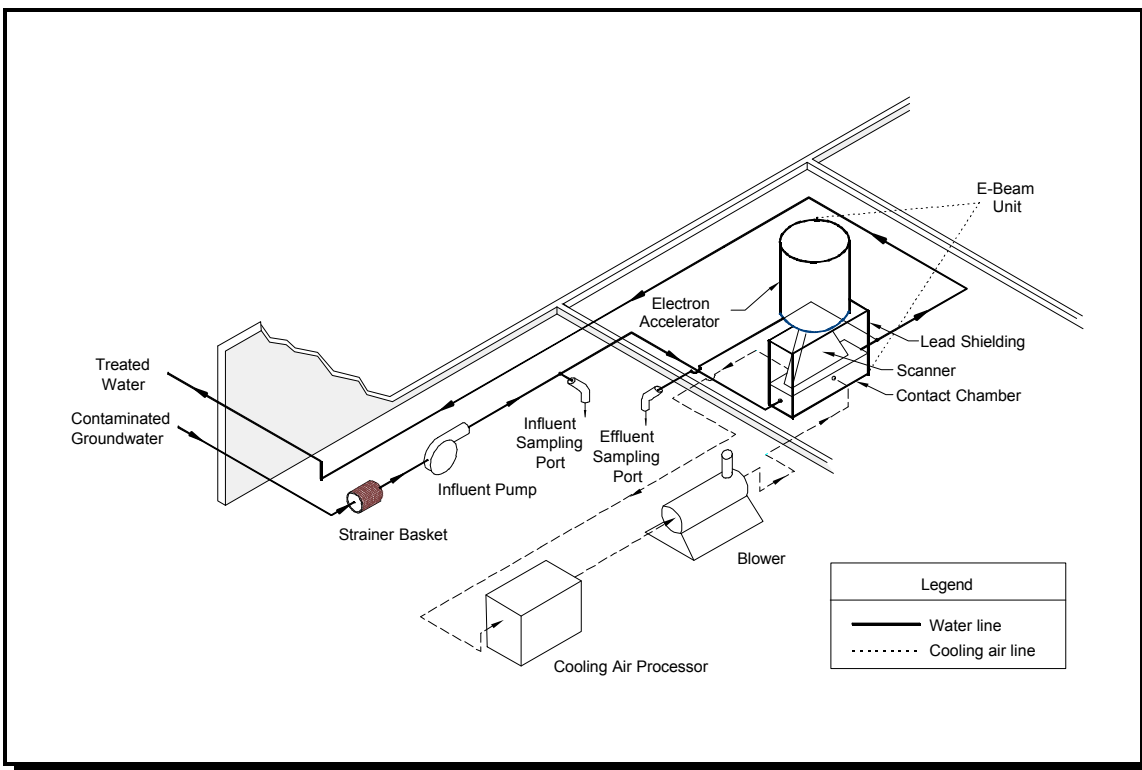
Mike Magee / NAS North Island / (619) 545-2709

William Cooper / HVEA / (303) 593-5330

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NAS North Island. Summary of Results, Bench-Scale Treatability Study of the Electron Beam Technology for Treating Groundwater from Naval Air Station North Island. January 4, 1995.



HVEA Electron Beam Technology Schematic

BIOCONVERTERS BIOREMEDIATION TECHNOLOGY

Naval Air Station North Island
San Diego, California

Mission: Groundwater remediation
Contaminants: Chlorinated solvents
Timeframe: July 1994 through February 1995
Status: Completed, Not Exportable

Synopsis

This treatability study was designed to evaluate the ability of the BioConverters, Inc. (BCI) proprietary microorganisms to degrade trichloroethene (TCE) in groundwater from NAS North Island Site 9. Three drums of purge water from Site 9 monitor wells were used for the study. After equalizing the concentrations of TCE in each drum, BCI microorganisms and nutrients were added to two drums; one was a control. Samples were collected at the beginning of the study and at 7, 14, 28, 42, and 77 days after initiation. Samples were analyzed for chlorinated VOCs, field parameters, and nutrients. A treatability study report was issued in mid-February 1995 indicating no difference in treatment effectiveness between the drums treated with microorganism and the control drum. NAS North Island is not considering the BCI bioremediation technology for use at other sites.

Date	Accomplishments
August 1994	Treatability test plan was issued.
August 1994 to December 1994	Sampling and analysis were conducted for treatability study.
January through February 1995	Data were evaluated.
February 1995	Treatability study report was issued.

BIOCONVERTERS BIOREMEDIATION TECHNOLOGY (CONTINUED)

Contacts for Further Information

Mike Magee / NAS North Island / (619) 545-2709

Jerry Finney / BCI / (505) 632-5578

Bibliography

Test Plan, BioConverters Treatability Study, NAS North Island. August 12, 1994.

Treatability Study Report, BioConverters Bioremediation Technology, NAS North Island. February 3, 1995.

IT CORPORATION IN SITU GROUNDWATER TREATMENT TECHNOLOGY

Naval Air Station North Island San Diego, California

Mission:	In situ groundwater remediation
Contaminants:	VOCs
Timeframe:	Demonstration will not be conducted at NAS North Island
Status:	Completed, Not Exportable

Synopsis

The International Technology (IT) Corporation's in situ groundwater treatment system removes VOCs from groundwater by transferring them to a vapor phase and destroying them with a photocatalytic oxidation (PCO) unit, possibly followed by treatment with granular activated carbon (GAC). The system is designed to remove VOCs to below federal maximum contaminant levels (MCLs) in the first pass.

The process consists of three elements: (1) air lift pumping, (2) in situ vapor stripping, and (3) air sparging. An extraction unit well is installed at the bottom of the contaminated aquifer. In the first stage, air is injected into an eductor pipe, lifting the contaminated groundwater up through the pipe. The lifting action causes displacement of groundwater from the lower section of the well, which is replaced by contaminated groundwater from the lower aquifer. Air bubbles and water mix as they move up the eductor pipe. As the bubbles travel upward, partial transfer of VOCs from water phase to vapor phase occurs. The vapor phase of the contaminants is then drawn off by a vacuum system.

In the second stage, water that has been lifted to the top of the well is sprayed as fine droplets inside the well casing. Countercurrent air flow strips additional VOCs from the water.

Finally, the groundwater is sparged as it collects at the water table, in the upper portion of the well, prior to re-entering the aquifer. A packer separates the upper well from the lower, forcing water to recharge at the water table.

Water from the lower portion of the aquifer flows into the well to replace the air-lifted water, causing drawdown. Thus, water is circulated from the lower portion of the aquifer into the well and then back

IT CORPORATION IN SITU GROUNDWATER TREATMENT TECHNOLOGY (CONTINUED)

to the upper portion of the aquifer, establishing a recirculating treatment zone.

The demonstration was planned in cooperation with the EPA SITE Program. Negotiations between IT and the Navy did not result in an acceptable cost sharing agreement. There are no current plans to proceed with the field demonstration at NAS North Island.

Contacts for Further Information

Mike Magee / NAS North Island / (619) 545-2709

Michelle Simon / U.S. EPA / (513) 569-7469

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U.S. EPA. U.S. EPA Superfund Innovative Technology Evaluation Program Quality Assurance Project Plan - International Technology Corporation In Situ Groundwater Treatment Technology Demonstration at March Air Force Base, California. April 1993.

SEVENSON MAECTITE FIXATION TECHNOLOGY

Naval Air Station North Island San Diego, California

Mission: Reduce mobility of soil contaminants
Contaminants: Lead and other heavy metals
Timeframe: August 1994 through January 1995
Status: Completed, Not Exportable

Synopsis

A bench-scale treatability study was conducted to evaluate the effectiveness of the Severson Maectite Fixation technology on heavy metal-contaminated soil from Sites 4 and 7 at NAS North Island. The study was conducted in cooperation with the EPA SITE program. The Maectite Fixation technology is a two-step process that converts leachable lead and other heavy metals to insoluble mineral crystals. The Maectite process has been successful at a number of different sites that had variable waste characteristics.

The treatability study indicated that lead and chromium can be chemically fixed in NAS North Island soils. The study, however, indicated that the high organic contaminant levels in the soil may interfere with full-scale chemical fixation. There are no immediate plans to continue with demonstration of the technology at NAS North Island or export the technology to other sites.

Date	Accomplishments
August 1994	Samples were collected from two NAS North Island facilities for characterization and bench-scale treatability studies.
September 1994	Bench-scale treatability study was conducted.
October 1994	Treatability study report was proposed.
November 1994	Treatability study report was submitted to the Navy.

SEVENSON MAECTITE FIXATION TECHNOLOGY (CONTINUED)

Contacts for Further Information

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Karl Yost / Severson / (210) 836-0116

S. Jackson Hubbard / EPA / (513) 569-7507

Bibliography

Sevenson Environmental Services, Inc. Maectite Treatment Process Bench-Scale Treatability Study
Report for NAS North Island, San Diego, California. U.S. EPA SITE Report. November
1994.

BIOCONVERTERS FUEL FARM TREATABILITY STUDY

Naval Air Station North Island
San Diego, California

Mission: Compare exogenous and indigenous microorganisms for the bioremediation of diesel fuel-contaminated soil

Contaminants: Diesel fuel

Timeframe: February 1995 through May 1995

Status: Completed, Not Exportable

Synopsis

A treatability study was completed to compare the effectiveness of exogenous (introduced) microorganisms with indigenous (native) microorganisms on above-ground bioremediation of diesel fuel-contaminated soil. The exogenous microorganisms were supplied by BCI and have been used to degrade petroleum hydrocarbon compounds on other projects.

Two biocells were constructed to hold diesel fuel-contaminated soils. Initial soil samples were collected from both biocells and analyzed to determine baseline contaminant concentrations. Nutrients (nitrite, phosphorus, and potassium commercial fertilizers) and water were applied to both biocells. BCI microorganisms were applied to one of the biocells, while the other biocell served as a control. The soils were not tilled or actively aerated during the test; however, the piles were only 1 foot to 2 feet high, which allowed sufficient oxygen transfer. Soil samples were collected and analyzed periodically to compare the biodegradation rates of both biocells. Results of the treatability study indicated that no significant decrease in contaminant concentration was observed.

Date	Accomplishments
February 1995	Fertilizers, water, and microbes applied to biocells.
April 1995	Bioremediation study was completed.
FY 1996	Final report that compares the effectiveness of exogenous microorganisms to indigenous microorganisms was submitted.

BIOCONVERTERS FUEL FARM TREATABILITY STUDY (CONTINUED)

Contacts for Further Information

Richard Mach / SWDIV / (619) 532-1156

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Metcalf & Eddy. Work Plan to Conduct Ex Situ Biotreatability Test, NAS North Island Fuel Farm. September 16, 1994.

Metcalf & Eddy. Draft Bioremediation Pilot Study Report, NAS North Island Fuel Farm. November 1995.

NELP PROJECTS

Compliance



WASH RACK WATER RECYCLING SYSTEM

Naval Air Station North Island
San Diego, California

Mission:	Eliminate discharge water in to storm drains
Contaminants:	Oily waste water
Timeframe:	1996
Status:	Completed, exportable

Synopsis

The wash rack water recycling system (WRWRS) implemented at NAS North Island eliminates and reuses wastewater generated during vehicle washing at NAS North Island. The WRWRS replaces a wash system that discharged oily wastewater to the storm and sewer drains and consumed large volumes of water in the process.

The WRWRS combines high-pressure, low-volume, heated pressure washers and a water recycling unit to provide a zero-discharge, self-contained, closed-looped wash rack. The water is collected in a catch basin and pumped above ground to the system where it is filtered, cleaned, and stored in a 500-gallon aboveground storage tank to reuse.

The wash rack system is unique in that the system operates self sufficiently and is completely self contained, which helps reduce the amount of water used and discharged for vehicle washing. The wash rack system is completely above ground as opposed to the previous underground oil/water separator units, thus eliminating the potential for subsurface contamination.

The cost for the WRWRS is approximately \$29,000, including installation; however, if a concrete pad is not existent, additional costs may be incurred. NAS North Island currently has one WRWRS system in use and is determining volumetric quantities of saved water. The cost savings for this unit are also being evaluated; however, the savings are presumed to be substantial.

WASH RACK WATER RECYCLING SYSTEM (CONTINUED)

Date	Accomplishments
Spring 1996	The WRWRS was installed and is operational at COMNAVAIRPAC Support Services Division.

Date	Current Activities
Summer 1996	Cost savings for the WRWRS is being evaluated by Commander Naval Air Forces (CNAP).

Date	Horizon
Summer 1996	Wash rack water recycling system will be installed at AIMD.
Fall 1996	Wash rack water recycling system will be installed at MWR golf maintenance shop.

Contacts for Further Information

Ed Bonnes, NAS North Island, (619) 545-3426
Hector Padilla, CNAP Support Services, (619) 545-6692

Bibliography

Vendors brochure: "Hydro Engineering" model HE4/2000 EHGV ACE Press
"RGF" model SM2 Ultrasorb Water Recycler



VISTA RESEARCH, INC. PIPELINE LEAK DETECTION

Naval Air Station North Island
San Diego, California

Mission:	Detect small leaks in pressurized underground fuel pipelines
Contaminants:	Fuel
Timeframe:	1994 through 1996
Status:	Active

Synopsis

Through the SWDIV NT innovative technologies solicitation, the Navy entered into a cost-sharing contract with Vista Research, Inc. (Vista) to demonstrate an innovative leak detection system. Vista's pipeline leak detection technology compensates for thermal expansion and contraction of fuel in the pipeline (the main source of error affecting standard line integrity tests). This compensation is achieved through electronic data collection and signal processing. Using Vista's technology, the time required for pipeline integrity testing can be reduced from as much as half a day to less than 30 minutes. It is also not necessary to drain the line for leak detection since the fuel itself is part of the testing method.

Vista offers three configurations of its pipeline leak detection technology: the manual line tester (MALT), the semiautomatic line tester (SALT), and the fully automatic line tester (FALT). Under the MALT configuration, leaks at passive system pressure are estimated using a sight glass. Under the SALT configuration, a battery-operated detector is used to indicate leaks at passive system pressure. Under the FALT configuration, a computer-controlled pump pressurizes the system and measures leaks electronically. The SALT and MALT configurations are designed specifically to test underground lines typically found at bulk fuel storage facilities. The FALT system is designed for underground oil-filled power transmission cables, airport hydrant systems, and lines that transfer fuel beyond the fuel farm fenceline. Vista claims that even leak rates represented by extremely small volume changes in the line (down to approximately 4 milliliters) can be estimated using its technology.

The MALT system was demonstrated and evaluated at the NAS North Island Fuel Farm in April 1996. The initial results of the MALT demonstration were positive, and a final demonstration report is being prepared. Also, third party certification of the MALT system has been completed, and the certification has been submitted to the State of California for final approval.

VISTA RESEARCH, INC. PIPELINE LEAK DETECTION (CONTINUED)

Date	Accomplishments
1996	Demonstration work plan was finalized.
1996	Field demonstration was completed; MALT demonstration and 3rd party certification was completed. Certification was submitted to the State of California for final approval.
June 1996	Draft demonstration report was completed.

Date	Current Activities
1996	Final demonstration report is being prepared.

Date	Horizon
1997	NAS North Island is exploring opportunities to use MALT or FALT to test large diameter pipes for potential leaks.
1997	Technology will be exported, if successful.

Contacts for Further Information

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Jun Figueroa / NAS North Island / (619) 545-2431
Michael Fierro / Vista Research Inc. / (415) 966-1171

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Vendor brochure, Vista Research, Inc..

Vista Research Inc. Draft Final Demonstration Report. June 1996



EET, INC. TEXTXTRACT CHEMICAL DECONTAMINATION PILOT STUDY

Naval Aviation Depot North Island

Mission: Decontamination of structures and equipment
Contaminants: Metals, VOCs, SVOCs
Timeframe: 1994 through 1996
Status: Active

Synopsis

Under the SWDIV NT innovative technologies solicitation, NELP is evaluating the TextXtract decontamination process developed by EET, Inc. The TextXtract technology is used to remove metals, VOCs, SVOCs, PCBs, and radionuclides from concrete, brick, asphalt, wood, iron, steel, and other metals. The TextXtract technology is a three-stage process using three proprietary chemical formulas, tailored to site-specific characteristics, that penetrate the pores of the contaminated media to remove contaminants without destroying the contaminated material's surface or substrate. The chemicals do not contain any RCRA-regulated constituents.

EET, Inc. has completed a demonstration pilot study which involved testing the TextXtract process in two areas: (1) concrete contaminated with hydraulic oil and fuels, (2) concrete contaminated with heavy metals. By extracting the contaminants from the surface and subsurface, the materials can be left in place, reused, or recycled, rather than disposed, resulting in potential cost savings to the Navy. The cost savings associated with this technology are currently being evaluated and will be presented in the final demonstration report.

Date	Accomplishments
1st Quarter FY 1996	Final demonstration work plan issued.
June 1996	TextXtract chemical decontamination pilot study was completed.

EET, INC. TEXTXTRACT CHEMICAL DECONTAMINATION TECHNOLOGY (CONTINUED)

Date	Horizon
1996	Final laboratory results and demonstration report will be submitted.
1997	Technology will be exported, if successful.

Contacts for Further Information

Kerri Holzer / NADEP / (619) 545-3342

Doug Casey / SWDIV / (619) 532-1448

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EET, Inc. TextXtract Decontamination Demonstration Project Work Plan. 1995.

Draft NELP Technology Demonstration Quality Assurance Project Plan, EET, Inc., Bechtel National, Inc., 1996.



MANAGEMENT ACTION PLAN

Naval Air Station North Island San Diego, California

Mission: Summarize status of environmental restoration and compliance programs
Contaminants: Various
Timeframe: Ongoing since 1994
Status: Completed, Exportable

Synopsis

The NAS North Island Management Action Plan (MAP) was developed in 1994 to summarize the status of the installation restoration and compliance programs, including the resolution status of technical issues, and presents a comprehensive strategy for implementing response actions. The NAS North Island environmental program managers will use the MAP to direct and monitor the IR and compliance programs.

A MAP review team was established to prepare annual updates to the MAP, and to create a forum for environmental discussions. The team holds meetings, as necessary, to share information regarding environmental investigations, treatment and remediation technologies, data management and analysis, background levels of contaminants in environmental media, data gap review, risk assessment protocols, compliance strategies, and other environmental restoration issues relevant to the MAP. Principal participants include the Staff Civil Engineer (SCE) NAS North Island Environmental Division Director, the NAS North Island IR program and NELP Manager, the lead NFEC SWDIV remedial project manager (RPM) for NAS North Island, a NADEP project representative, a PWC project representative, the NAS North Island Public Affairs Officer (PAO), and a Comprehensive Long-Term Environmental Action Navy (CLEAN) contractor representative.

Date	Accomplishments
March 1994	Original MAP was published.
March 1994 - May 1995	MAP review team provided comments on the original MAP; comments were incorporated.

MANAGEMENT ACTION PLAN (CONTINUED)

Date	Accomplishments (Continued)
March 1996	First updated MAP was completed.

Date	Horizon
1997	MAP will be updated as needed.

Contacts for Further Information

Arno Bernardo / NAS North Island / (619) 545-1125

Bill Collins / SWDIV / (619) 532-2337

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NAS North Island. Management Action Plan Naval Air Station North Island San Diego, California.

March 1996.



DIGITAL CAMERA

Naval Air Station North Island
San Diego, California

Mission: Improve documentation capabilities of NAS North Island
Contaminants: N/A
Timeframe: 1996
Status: Completed, Exportable

Synopsis

NAS North Island purchased a digital camera in March 1996. The digital camera can be used to record images electronically, so that they may be stored in various graphic formats requiring significantly less storage space and records management problems. Once in the computer, the images can be manipulated and edited as desired, printed, sent electronically as e-mail attachments, or posted into documents by using various software programs. The digital camera is expected to increase the efficiency and capabilities of the environmental program at NAS North Island. It also results in Pollution Prevention by eliminating chemicals associated with processing typical photographs.

The total cost to the Navy for the camera, 5 MB memory card, and universal power supply was \$1,359.60. Use of the digital camera is expected to result in significant cost savings due to increased efficiency in preparing factsheets, brochures, world-wide-web (WWW) page information, Navy briefs, and public presentations. The digital camera can be locally procured by all Navy agencies, and is available under GSA contract GS00K95AGS6407.

Date	Accomplishments
March 1996	A digital camera was procured.

Date	Current Activities
1996 - 1997	Digital images are being used to produce factsheets, brochures, WWW pages, Navy briefs, and public presentations.

DIGITAL CAMERA (CONTINUED)

Contacts for Further Information

Mike Magee / NAS North Island / (619) 545-2709

Bibliography

Schaub, George. Pictures Bit-By-Bit. Popular Mechanics. August 1995.



THERMATRIX, INC. FLAMELESS OXIDATION TECHNOLOGY

Naval Air Station North Island
San Diego, California

Mission:	Control fugitive emissions
Contaminants:	VOCs
Timeframe:	June 1994 through December 1995
Status:	Completed, Exportable

Synopsis

The Thermatrix flameless oxidation technology is an advanced treatment process for the destruction of VOC emissions. Under the SWDIV NT innovative technologies solicitation, the technology was demonstrated for the control of VOCs from a JP-5 transfer pump at the NAS North Island Fuel Farm. While traditional flame-based thermal oxidation relies on the flame for both fume mixing and reaction, the Thermatrix process completely decouples fume mixing from the oxidation reaction. The patented technology involves oxidation of VOCs to carbon dioxide (CO_2) and Water (H_2O) in a ceramic matrix, “packed bed” reactor. The three primary attributes of this destruction matrix are interstitial geometry which enhances mixing, thermal inertia that promotes stability, and surface characteristics that augment heat transfer. As an alternative to incineration, this treatment process achieves high destruction and removal efficiencies, while avoiding the thermal formation of nitrogen oxides and the products of incomplete combustion that are common with incineration. Thermatrix claims that the technology is applicable to fugitive emissions from paint spray booths and fuel transfer pumps.

During the demonstration, total hydrocarbon and gaseous emissions were measured on a flameless thermal oxidizer that processed a portion of the vent stream from a fuel tank (gases venting during the tank filling process). The test involved three separate measurements over the course of three tank filling events and was completed in July 1995. The demonstration documented removal efficiencies that were equal to or greater than 99.99 percent, and corresponding emissions of both carbon monoxide (CO) and nitrogen oxide (NO_x) are below currently accepted standards; CO emissions averaged 2.0 parts per million (ppm) with a maximum of 2.2 ppm, and NO_x emissions averaged 0.65 parts per million (ppm) with a maximum of 0.72 ppm. Although additional testing was recommended to refine the optimal operating conditions and capabilities further, the results indicate that the demonstration was a success.

THERMATRIX, INC. FLAMELESS OXIDATION TECHNOLOGY (CONTINUED)

Thermatrix estimated that, depending on VOC loading, the cost per ton of VOC treated for a 10,000 cubic foot per minute (cfm) system can range from \$122 to \$2,983 depending on the VOC concentration of the emissions. The cost savings to NAS North Island has not been calculated, but Thermatrix project experience indicates that significant cost savings may be realized. According to Thermatrix, a major west coast refinery that replaced 400 existing pumps with seal-less pumps to adhere to more stringent regulatory requirements would have cost \$7,160,000. By installing Thermatrix oxidizers at a ratio of one oxidizer for 8 pumps, the total cost of Thermatrix oxidizers was \$1,350,000, indicating a savings of about 80 percent.

Date	Accomplishments
July 1995	Demonstration was completed.
November 1995	Final demonstration report was issued.

Date	Horizon
FY 1996	Technology will be exported, if successful.

Contacts for Further Information

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THERMATRIX, INC.
FLAMELESS OXIDATION TECHNOLOGY
(CONTINUED)

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Thermatrix, Inc. Demonstration Work Plan. December, 1994.

Thermatrix, Inc. Project Quality Control Plan. December 5, 1994.

Thermatrix, Inc. Site Health and Safety Plan. December 12, 1994.

Radian Corporation. Source Test Results for Flameless Thermal Oxidizer. August 7, 1995.

Naval Air Station North Island. Thermatrix NELP Technology Demonstration Report. San Diego, California. February 1996.

GROUND SUPPORT EQUIPMENT AIR EMISSIONS REDUCTION

Naval Air Station North Island
San Diego, California

Mission:	Reduce emissions from ground support equipment
Contaminants:	NO _x
Timeframe:	March 1994 through 1996
Status:	Active

Synopsis

In order to comply with NO_x emissions levels specified by Clean Air Act regulations (including Title V permits and the Federal Implementation Plan) and the 50 percent reduction goals of Executive Order 12856, NAS North Island is replacing three ground support equipment (GSE) engines with low emission engines, and installing electric power distribution systems for GSE.

The three GSE engines that are being considered for replacement are: A/M27T-5 portable hydraulic power supplies ("Jennies"), A/M32C-17 mobile air conditioner (AIRCON), and NC-10C mobile electric power plants (MEPPs) (see attached figure). These mobile units will be modified with engines capable of meeting federal and San Diego County emission standards for 1996. After making the proposed modifications into prototypes (two of each type), the units will be tested to evaluate their effectiveness in reducing emissions.

The total estimated cost for modifying all three GSE engines, which included review for availability, engine selection, design, modification, and testing and evaluation, is \$700,000. The cost for selection and procurement of an appropriate engine, was \$50,000 each for the Jennies and \$39,000 for the AIRCON.

The installation of an electric power distribution system or Flight Line Electrical Distribution System (FLEDS) greatly reduces the demand for diesel powered MEPPs. Several standard FLEDS were procured in 1994 and were installed at NAS North Island in 1995. To enable the use of existing zero emission GSE further, new "Super" FLEDS are being developed under NELP. Super FLEDS will allow use of the electrically powered Jennies (A/M27T-7) and AIRCON (A/M32C 21) on the aircraft flight line. Electrically powered Jennies are currently restricted to use inside aircraft hangars.

GROUND SUPPORT EQUIPMENT AIR EMISSION REDUCTION (CONTINUED)

The total estimated cost to the Navy for development of the Super FLEDS is \$1,250,000. The use of Super FLEDS will reduce the Navy's requirement for diesel powered GSE by approximately 75 percent. This significant reduction in diesel emissions will make it possible for NAS North Island to achieve its mission to comply with federal and local air emissions regulations. The State of California is currently evaluating a draft regulation (AB 531) that will replace the permitting program for military tactical support equipment with a registration program.

Date	Accomplishments
November 1994	Contract to develop low emission diesel engine was modified.
December 1994	Engine was reviewed with Jennies and AIRCON contractors.
February 1995	First engine was delivered: the John Deere Straight 6.
January - March 1995	Super FLEDS engineering analysis, systems requirements, site survey, vendor survey was performed.
Spring/ Summer 1995	Designed super FLEDS.
	NAS North Island Aircraft Intermediate Maintenance Department (AIMD) provided Naval Air Weapons Center, Lakehurst (NAWCADLKE) with two each of Jenny, AIRCON, and MEPP.
March 1996	FLEDS system was installed in Building 1456

Date	Horizon
1996	Super FLEDS system will be installed and tested.

Contacts for Further Information

Jose Casora / NAS North Island / (619) 545-2434

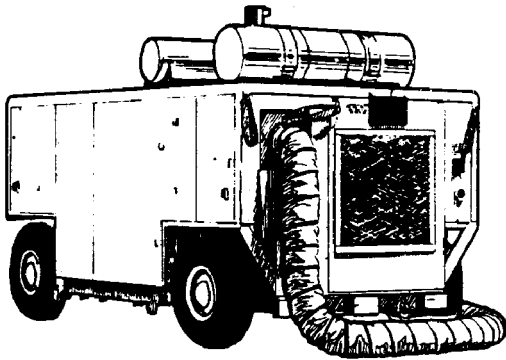
Dan Glass / CNO N45 / (703) 602-4497

GROUND SUPPORT EQUIPMENT AIR EMISSION REDUCTION (CONTINUED)

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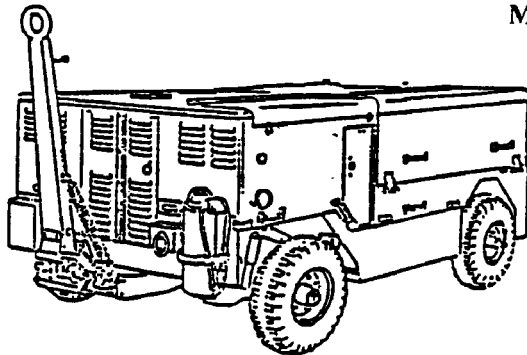
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GROUND SUPPORT EQUIPMENT AIR EMISSION REDUCTION (CONTINUED)

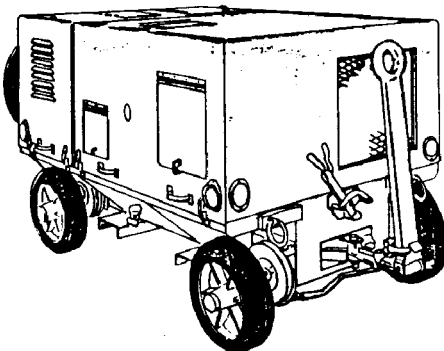


A/M 32C-17(NR-8)

MOBILE AIR CONDITIONER



Mobile Electric Power Plant, Model NC-10C



A/M27T-5

PORTABLE HYDRAULIC POWER SUPPLY

EMISSION REDUCTION CREDIT DEMONSTRATIONS

Naval Air Station North Island San Diego, California

Mission: Demonstrate the process of applying for emission reduction credits (ERC) in the San Diego Air Pollution Control District

Contaminants: VOCs

Timeframe: February 1995 through 1996

Status: Active

Synopsis

Managing the VOC emissions at NAS North Island so that total emissions do not increase is performed using Emission Reduction Credits (ERC), an emissions accounting process used to trade emission reductions from one location for increase at another location. NAS North Island is currently exploring projects to demonstrate the ERC process and validate the regulatory interpretations documented in the ERC flowchart (see Air Quality Regulatory Flowcharts) project overview.

Date	Accomplishments
January 1995	Daily use logs for Stoddard solvent were reviewed. The records appear to provide adequate documentation of current VOC emissions.
	A draft ERC flowchart was completed.

Date	Horizon
FY 1996	Projects will be identified that are qualified to demonstrate the ERC process and validate the regulatory interpretations.

EMISSION REDUCTION CREDIT DEMONSTRATIONS (CONTINUED)

Contacts for Further Information

Jose Casora / NAS North Island / (619) 545-2434

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County of San Diego Air Pollution Control District. Rules and Regulations. San Diego, CA.
September 1994.

ENVIROCOM AIR EMISSIONS TRACKING SYSTEM

Naval Aviation Depot North Island San Diego, California

Mission:	Create a tool to assist with environmental planning and air quality compliance
Contaminants:	Various
Timeframe:	1995 to 1996
Status:	Active

Synopsis

The Naval Aviation Depot North Island (NADEP) is currently evaluating the EnviroCom air emissions tracking system. EnviroCom is a user-friendly software package that maintains a database of emissions information. Emissions data fields in the EnviroCom software package include process rates, operating schedules, emission formula variables specific to the source, emission factors, and other information used to calculate emissions. The program creates emissions inventories for both criteria and toxic pollutants. Inventories are required by the San Diego County APCD annually for air emissions and every four years for air toxics. In addition, the toxics inventory data can be used to calculate health risk assessments associated with air emissions.

The EnviroCom system requires more time to generate reports and input data than the old dBase III+ system required; however, the EnviroCom system provides expanded capabilities. For example, using the new EnviroCom system, air emissions can be organized on an hourly, daily, or yearly basis. In addition, automated emission inventories can be printed directly onto the report forms.

It is estimated that NADEP would save \$250,000 annually by completing toxic inventories in-house using the EnviroCom system.

NADEP is currently testing and troubleshooting the EnviroCom system before any decisions are made to export the product. NADEP is also evaluating new modules for the EnviroCom system that will automatically produce individual air emissions sources and possibly incorporate graphical outputs to calculate health risk assessments.

ENVIROCOM AIR EMISSIONS TRACKING SYSTEM (CONTINUED)

Date	Accomplishments
March 1994	NADEP's air emissions tracking system was completed in-house.
October 1994	Programmers was contracted to automate the system in a user-friendly package called EnviroCom, based on FoxPro.
January 1996	Installation and automation of EnviroCom system was completed.

Date	Current Activities
1996	Testing and troubleshooting of the EnviroCom system is being performed.

Date	Horizon
Summer/Fall 1996	The system will be evaluated for exporting to other bases; training workshops may be conducted by NADEP.
	A new module will be developed to produce individual air emission source(s) automatically for the entire facility's health risk assessment.
	Graphical output will be incorporated to calculate health risk assessments.

Contacts for Further Information

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Michele Marien / NADEP / (619) 545-2234

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Naval Aviation Depot North Island. Air Pollution Abatement Program Management Plan. December 23, 1993.

SELF INSPECTION PROGRAM

Naval Aviation Depot North Island San Diego, California

Mission:	Prevent environmental violations of air emissions and hazardous waste regulations
Contaminants:	Criteria and toxic air pollutants, hazardous waste
Timeframe:	Ongoing since 1992
Status:	Completed, Exportable

Synopsis

To improve environmental compliance, NADEP has implemented a self-inspection program that focuses on violations that are caused by a lack of information on air and hazardous waste regulations. NADEP inspectors are trained in hazardous waste and air regulations and they accompany regulators during their inspections to learn practical inspection techniques and "what to look for." NADEP inspectors regularly tour NADEP facilities and issue in-house potential notice of violations (PNOVs) for any probable violations they may locate. The facility can then take the necessary steps to address the areas of concern, and minimize the violations found by regulatory inspectors.

This proactive self-inspection program enables NADEP to reduce the costly fines or permitting restrictions that typically accompany regulatory enforcement. In addition, in-house inspectors can educate facility personnel responsible for equipment or processes that generate regulated air emissions or hazardous waste.

NADEP is inspected annually by the San Diego County APCD for air NOVs and by California DTSC for hazardous waste NOVs. The inspections last about 3 to 6 weeks. In addition, other regulatory agencies including the California Air Resources Board, CAL EPA and federal EPA Region IX can enter at any time to inspect for air or hazardous waste compliance.

Before the self-inspection program began, NADEP averaged approximately \$50,000 per year in air compliance fines. In the first year of self-inspection, the fines dropped to \$8,000, and in the subsequent years (1993, 1994, and 1995) there were no violations. After Title V of the Clean Air Act is implemented in late 1996, the fines will assume continuous noncompliance at maximum penalties of \$25,000 per day.

SELF INSPECTION PROGRAM (CONTINUED)

NADEP was averaging four violations of hazardous waste regulations per year before implementation of the self inspection program,. According to the Federal Facilities Compliance Act, the four violations would result in costs of about \$100,000 per year; with the self-inspection program in place, violations have been minimal.

Date	Accomplishments
1992	Internal inspectors were appointed on experimental basis.
May 1993	Two full-time positions were established for environmental protection specialist to conduct internal inspections.
1995, 95, and 96	Annual APCD and hazardous waste inspections resulted in zero NOV's.

Date	Current Activities
1996	Self-inspection are continuing to maintain zero NOV status.

Date	Accomplishment
December 1996	Energy and water conservation inspections will be incorporated.

Contacts for Further Information

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 Ted Beyer (Hazardous waste and air) / NADEP / (619) 545-4905
 Linda Goelze (Air) / NADEP / (619) 545-2908
 Bob Espinosa (Hazardous waste) / NADEP / (619) 545-2906

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NADEP, North Island. NADEP Undergoes Most Successful Air Pollution Inspection. Depot Talk, July 1994.

AIR QUALITY REGULATORY FLOWCHARTS

Naval Air Station North Island San Diego, California

Mission:	Translate various San Diego County APCD rules into flowcharts to facilitate regulatory compliance
Contaminants:	Nitrogen Oxides, VOCs, Sulphur Oxides, CO, Lead, Particulate Matter
Timeframe:	October 1994 through March 1995
Status:	Completed, Exportable

Synopsis

NAS North Island prepared regulatory flowcharts interpreting the rules of the San Diego County APCD. The flowcharts are regulatory management tools that assist environmental managers in becoming more efficient by clarifying the steps necessary for compliance. Although these flowcharts have been customized for San Diego County, they can be adapted to other areas.

For example, one flowchart demonstrates how to apply for ERC. When a facility is located in a non-attainment zone for a Title I criteria pollutant, it cannot increase its emissions of that pollutant without documenting a reduction elsewhere in its operations. The process of receiving credit for these reductions involves filing an application with the local APCD, documenting the reductions, and "banking" them for later use. In general, the Navy has been unsuccessful in banking ERCs. Therefore, a detailed, step-wise flowchart outlining the ERC process has been developed (see ERC Demonstrations project description).

In another example, NAS North Island translated San Diego APCD's New Source Review (NSR) rules into a flowchart that illustrates how to fulfill the permitting requirements for new stationary sources.

The ERC and NSR flowchart were each produced for about \$6,000. If an environmental manager facing the ERC process saves 10 percent of the time it took to produce the flowchart, the flowchart will pay for itself in 10 uses. In the ERC and NSR examples, the Navy saves \$600 every time a base modification results in a requirement for a new stationary source.

AIR QUALITY REGULATORY FLOWCHARTS (CONTINUED)

Date	Accomplishments
December 1994	A draft ERC flowchart was completed and sent out for NAS North Island review.
January 1995	Two copies of the draft ERC flowchart were sent to the San Diego County APCD, courtesy of NAS North Island, for use at its permit assistance center. Development of the draft NSR flowchart began.
March 1995	The draft NSR flowchart was completed.
May 1995	The NSR flowchart was finalized.
July 1995	The draft ERC flowchart was verified during the ERC demonstrations, updated, and exported.

Date	Horizon
FY 1996	Export the ERC flowchart will continued.

Contacts for Further Information

Jose Casora / NAS North Island / (619) 545-2434

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County of San Diego Air Pollution Control District, Rules and Regulations, San Diego, California.
September 1994.

WASTE CLASSIFICATION FLOWCHARTS FOR CONTAMINATED SOIL

Naval Air Station North Island

Mission:	Provide guidance on the classification of contaminated soil so that decisions can be made on its reuse on site or disposal off site
Contaminants:	Various
Timeframe:	January through March 1995
Status:	Completed, Exportable

Synopsis

NAS North Island developed flowcharts to guide project managers in the classification of soil that is known or suspected to be contaminated so that decisions can be made on its reuse or disposal. Some of the information in these flowcharts is specific to San Diego County, such as the petroleum hydrocarbon-contaminated soil sampling requirements in the SAM Manual. These flowcharts are not intended to replace the regulations, but to help personnel make practical decisions regarding classification of waste as RCRA hazardous waste, non-RCRA (California only) hazardous waste, or non-hazardous waste.

To assist environmental managers, sections of the laws and regulations discussed in the flowcharts are included for reference, and an introduction to the classification, reuse, and disposal of contaminated soil is provided. Sampling and analytical requirements and analytical data interpretation for classification of soil contaminated with petroleum hydrocarbon products generated from UST or above-ground storage tank (AST) releases are also described, along with requirements and recommendations for classification of soil contaminated with nonpetroleum hydrocarbon products, such as chlorinated solvents, PCBs, pesticides, heavy metals, and unknown contaminants.

The flowcharts were produced for about \$8,400. This cost will be recovered in one use if the flowcharts help a project manager properly classify contaminated soil from one UST remediation project as non-hazardous according to RCRA. The average treatment of an UST generates contaminated soil on the order of 1,000 tons. Disposal at a Class I hazardous waste landfill costs approximately \$150 per ton. If a better understanding of the regulations results in the proper disposal of this soil at a Class II (designated waste) landfill, the cost per ton will be cut in half. Class III

WASTE CLASSIFICATION FLOWCHARTS FOR CONTAMINATED SOIL (CONTINUED)

(municipal) disposal costs only \$40 a ton, for a disposal cost savings of approximately \$11,000. The flowcharts may also facilitate the identification of proper on-site reuse options which could result in additional cost savings.

Date	Accomplishments
March 1995	Flowcharts were submitted to the Navy.

Date	Horizon
FY 1996	Export of waste classification flowcharts will continue.

Contact for Further Information

Mike Magee / NAS North Island / (619) 545-2709

Bibliography

PRC Environmental Management, Inc. Waste Classification for Contaminated Soil (Draft). March 3, 1995.

MESH PAD DEMISTER

Naval Aviation Depot North Island San Diego, California

Mission:	Comply with San Diego County APCD emission control standards; reduce toxic air emissions
Contaminants:	Hexavalent chromium
Timeframe:	Implemented in 1994
Status:	Completed, Exportable

Synopsis

The mesh pad "demister" or mist eliminator implemented at NADEP, North Island captures and reuses chromic acid emissions generated by NADEP's chrome plating process. This unit replaced a closed-loop wet scrubber system and was installed to meet air emission regulations. The mesh pad demister achieved the 99.8 percent chromic acid emissions removal efficiency required by the San Diego County APCD standards.

For hard chromium electroplating at large facilities, the mesh pad demister is the maximum achievable control technology (MACT), determined by the APCD. Title III of the Clean Air Act specifies the implementation schedule of MACT emissions controls. Existing facilities are required to achieve the removal efficiency of the mesh pad by January 25, 1997. New or reconstructed facilities must comply immediately upon startup.

The mesh pad demister unit at NADEP reduced operation costs because of its success in increasing the efficiency of the process. First, implementation of the unit eliminated final industrial wastewater treatment of hazardous wastewater (EPA RCRA waste D007) (the old wet scrubber system had generated a larger volume of wastewater than could be reused). Second, the demister reduced the amount of water used to replace plating tank evaporative losses. Third, it reduced chromium trioxide (CrO_3), reportable toxic chemicals, and other raw material requirements for the chrome plating tanks.

The cost for the mesh pad demister is approximately \$600,000, including installation. It was estimated that 900 gallons of water and 11.3 pounds of hexavalent chrome are reused daily, resulting in an annual cost saving of \$200,000.

MESH PAD DEMISTER (CONTINUED)

Date	Accomplishments
March 1994	Mesh pad demister was installed at NADEP in plating facility.

Date	Horizon
1996	Demister will be documented in P2 implementation opportunity handbook.
1999	Replacement of the filter materials may be required.

Contacts for Further Information

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Tom Miles / Conserve Engineering / (719) 494-6440

Midwest Air Products / (517) 723-8881

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NADEP, North Island. North Island Teamwork Gets New Chrome Scrubbers Installed. April 1994.
Depot Talk. Virginia Lyon.

Hokanson, D.C. Hill Air Force Base Upgrades Emission Control Equipment to Meet Anticipated
Chromium Standards, Pollution Equipment News reprint.

GENERIC PROFILING FOR HAZARDOUS WASTE

Naval Aviation Depot North Island
San Diego, California

Mission: Track hazardous waste with minimized administrative costs
Contaminants: All
Timeframe: 1995
Status: Completed, Exportable

Synopsis

NADEP, North Island has developed a streamlined, computerized database to comply with the Emergency Planning and Community Right-to-Know Act (EPCRA) and EPA's Biennial Report requirements. The generic profiling system eliminates paperwork and administrative costs that have typically accompanied NADEP's maintenance of detailed profiles used to identify the material, its hazardous constituents, federal hazard codes, and applicable transportation requirements for each waste stream. It combines like waste streams across shops, reducing the 2,000 individual profiles to 193 waste stream profiles. The new system generates a profile in minutes, a significant time savings over the old system which required approximately an hour of administrative labor to produce each profile.

About 40 activities providing data to PWC for production of the EPA's Biennial Report. NADEP's generic profiling system will reduce the time necessary to generate the data by three days. If the system is implemented regionally, it could save about \$6,000 for each report prepared.

The computerized system was implemented at a cost of \$90,000 ; however, the actual payback has never been calculated.

Date	Accomplishments
March 1995	New computerized database at NADEP was installed.
October 1995	Generic profiling system was completed.

GENERIC PROFILING FOR HAZARDOUS WASTE (CONTINUED)

Date	Horizon
FY 1996 to FY 1997	The generic profiling system will be exported to other installations

Contacts for Further Information

Bob Espinosa / NADEP / (619) 545-2906

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Ted Beyer / NADEP / (619) 545-4905

Bibliography

None available

INNOTEK NITREM TECHNOLOGY

Naval Air Station North Island
San Diego, California

Mission:	Wastewater treatment
Contaminants:	Various carbon and nitrogen-based contaminants
Timeframe:	March through December 1994
Status:	Completed, Not Exportable

Synopsis

A bench-scale study of the NitRem technology using a pilot-scale unit was conducted on a cyanide bearing plating waste stream from NAS North Island. Sam Houston State University (SHSU) and Innotek Corporation developed this new technology for destroying carbon- and nitrogen-based contaminants in wastewater. The NitRem technology is a noncatalytic hydrothermal process that converts carbon and nitrogen compounds into nitrogen gas, water, oxygen, and carbon dioxide. The NitRem process combines elements of two hydrothermal technologies, wet air oxidation and supercritical water oxidation, with new proprietary chemistry in a patented dual-shell, pressure-balanced vessel.

A total of 22.5 gallons of waste from NAS North Island was transported to Battelle Pacific Northwest Laboratories in Richland, Washington. Although the test was inconclusive in evaluating the effectiveness of the NitRem system for treating cyanide in wastewater, the technology showed technical promise in reducing the carbon load in wastewater. The study recommended that the NitRem system be further evaluated using wastewater with higher concentrations of organic and cyanide contamination before full-scale implementation occurs. The NELP management team determined that the pilot-scale unit was not adequately successful to begin field implementation at NAS North Island and recommended further field evaluation at a research and development facility.

INNOTEK NITREM TECHNOLOGY (CONTINUED)

Date	Accomplishments
March 10, 1994	A brief on the patented pressure vessel and the NITREM process was presented by SHSU and Innotek.
July 1994	NAS North Island and Innotek decided to test a cyanide bearing plating waste produced at NAS North Island.
September 16, 1994	A bench-scale test was conducted by Battelle.
February 1995	NAS North Island recommended further tests of the pilot-scale unit at a research and development facility.
1996	No further action for demonstrations under NELP at NAS North Island is planned at this time.

Contacts for Further Information

Mike Magee / NAS North Island / (619) 545-2709

Joe Graf / NAVFAC / (703) 325-0183

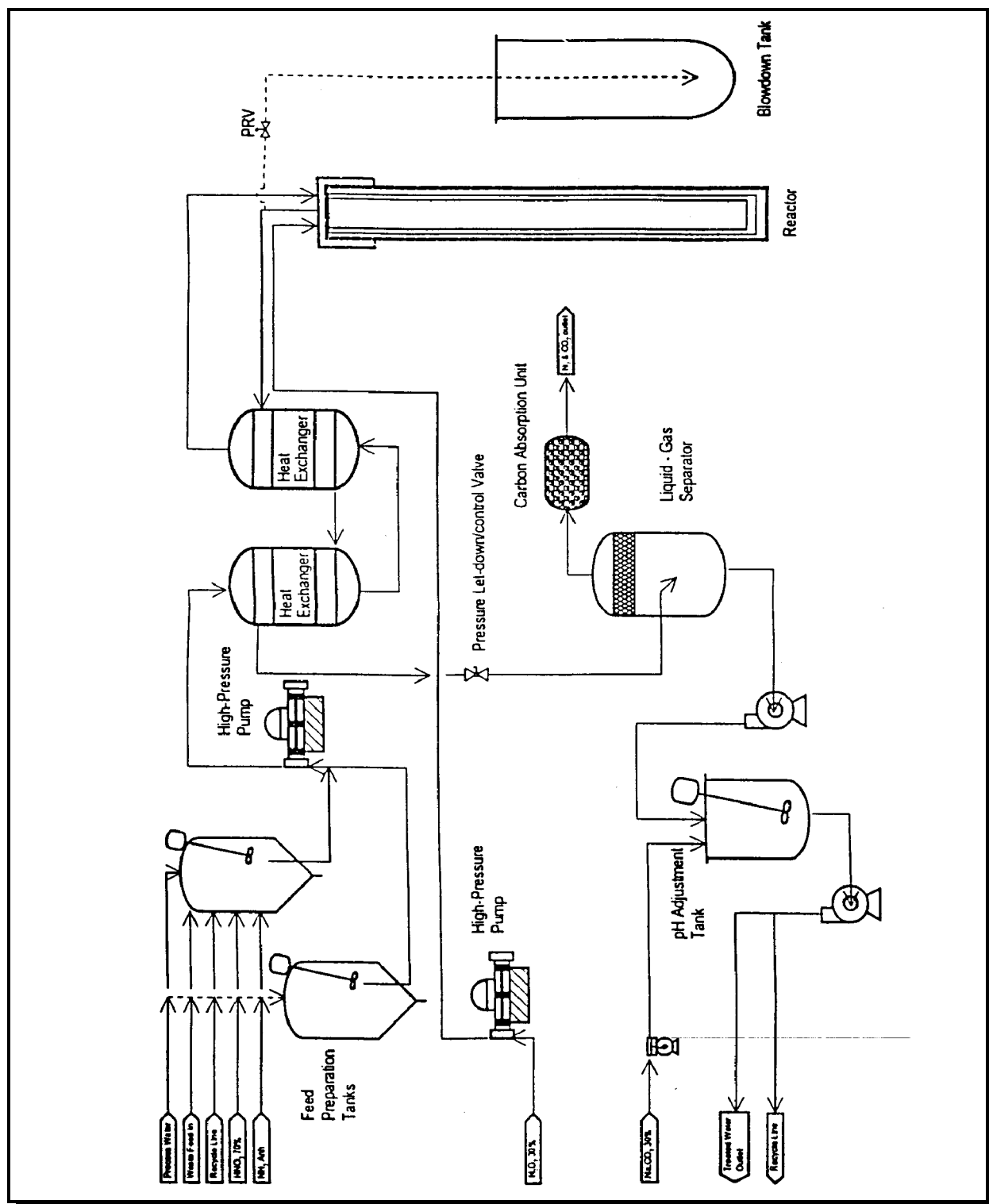
Dennis Cossey / Innotek / (501) 376-6477

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Innotek NitRem Bench-Scale Treatability Study Draft Evaluation Report - December 27, 1994, Navy Environmental Leadership Program.

INNOTEK NITREM TECHNOLOGY (CONTINUED)



NITREM Schematic of Major Process Equipment

NELP PROJECTS

Conservation



COOPERATIVE AGREEMENTS

Naval Air Station North Island San Diego, California

Mission:	Expand capabilities of Cultural Resources Management Program
Contaminants:	N/A
Timeframe:	Ongoing since 1983
Status:	Completed, Exportable

Synopsis

Cooperative agreements (CA) are partnerships between the Navy and academic or research institutions that reduce the costs typically incurred by cultural and historical surveys. CAs provide a mutually beneficial means of acquiring, analyzing, and interpreting historic or archaeological data, which can then be used to determine the significance of the cultural resources present.

NAS North Island's Cultural Resources Management Program (CRMP) implemented two types of cooperative agreements: (1) CAs and (2) cooperative research agreements (CRA). CAs are funded by the Navy and produce results that are directly related to achieving project-specific compliance with Sections 106 and 110 of the National Historic Preservation Act. Authorization for CAs is arranged through the Naval Facilities Engineering Command. Hourly labor rates for work performed under CAs are comparable to those of work performed by contractors, but the overhead costs of CAs are much lower. Overhead cost for labor under CAs ranges from 0 to 25 percent, which represents a significant savings from the 100 percent overhead cost that is typical for contractors.

CRAs are unfunded partnerships that benefit the Navy, but which have long-term relationships to the Navy compliance program. CRAs are arranged directly by the CRMP and are approved by the Commanding Officer of NAS North Island. Under CRAs, there are no labor or overhead costs for the work performed, although logistical support is provided to the collaborating research institution in exchange for the volunteer labor. Providing logistical support such as housing, food, and gas for 20 to 25 students costs the NAS North Island CRMP about \$5,000 per summer.

More than 6,000 hours of field labor have been performed in support of archaeological management projects over the last 10 years through CAs and CRAs. Since 1983, 32,000 hours of labor have been

COOPERATIVE AGREEMENTS (CONTINUED)

contributed during nine cooperative field schools conducted at San Clemente Island. The hours provided by the researchers to these projects cost the Navy \$45,000, but are equivalent to more than \$1,250,000 of contracted labor.

Partnerships such as the ones developed at NAS North Island result in benefits of proactive management, reduced costs, improved stewardship of cultural resources, and increased flexibility. An example of a successful CAs:

In March 1996, an archaeological resource survey was required for a pending plan to upgrade roads on San Clemente Island. The Navy's planning department requested that the CRMP survey more than 50 kilometers of roads on San Clemente Island. Because the areas had previously been surveyed under various CAs and CRAs, the project could proceed without an additional 3- to 5-month study that would have been required to comply with Section 106 of the National Historic Preservation Act.

Date	Accomplishments
1983	First cooperative agreements were initiated.
1994	Advisory Council on Historic Preservation recognized the CRMP as "a noteworthy example of cultural resources planning and management," based on successful use of CAs.

Date	Current Activities
1996	Work is currently performed under 1 CA and 5 CRAs.
July 1996	CAs fact sheet is in preparation.

Date	Horizon
1997	The cooperative agreement initiative will be exported.
1997+	Development of new CAs and CRAs will continue as needed.

COOPERATIVE AGREEMENTS (CONTINUED)

Contacts for Further Information

Andy Yatsko / NAS North Island / (619) 545-1131

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Advisory Council on Historic Preservation. Defense Department Compliance with the National Historic Preservation Act: Section 202(a)(6) Evaluation Report. March 1994.



BURROWING OWL EDUCATION AND HABITAT ENHANCEMENT PROGRAMS

Naval Air Station North Island
San Diego, California

Mission:	Educate the public; maintain a stable burrowing owl population
Contaminants:	N/A
Timeframe:	Ongoing since 1991
Status:	Completed, Exportable

Synopsis

Innovative education and habitat enhancement initiatives at NAS North Island have successfully increased and maintained a stable population of burrowing owls, protected under the Migratory Bird Treaty. Due to pest management practices and habitat loss on the southern California coast, the burrowing owl population in California has been drastically reduced over the last 20 years. Specifically at NAS North Island, the Natural Resources Office (NRO) determined that the predominant reasons for owl habitat loss were the crushing of burrows by lawnmowers and the destruction of burrows to control ground squirrels.

In order to combat burrow loss, the NRO developed a public education initiative that consisted of identifying burrowing owl nests with clearly visible signs, and placing additional information signs at strategic locations on NAS North Island. Following the 1991 breeding season during which nest complexes were marked with signs, the number of burrowing owl nests increased significantly from 17 in 1991 to 26 in 1992.

The NRO initiated a proactive habitat enhancement program for burrowing owls currently inhabiting in a zone of NAS North Island that will become eelgrass mitigation areas. The program was designed to comply with applicable regulations so that the owls will be provided with a similar habitat to the one being destroyed, and that the endangered least tern, prey of the burrowing owl, would not be impacted by the move. These conservation initiatives proactively comply with regulations to protect the burrowing owl as well as the least tern, and minimize conflict between conservation goals and Navy operational needs.

BURROWING OWL EDUCATION AND RELOCATION INITIATIVES (CONTINUED)

The total cost to the Navy to implement public education through sign posting was about \$4,000. The minimal costs associated with the education and relocation conservation initiatives resulted in benefits that cannot be quantified.

Date	Accomplishments
1991	Nests were marked with yellow signs. Immediate population increase noted.
1992	Three information signs were placed in strategic locations on NAS North Island.

Date	Current Activities
1996	Wooden burrows are being constructed and placed in the new owl "condominium" location; impact of planned habitat enhancement program is being study.

Date	Horizon
1996+	Owls will be continually monitored to determine if new burrow habitation is successful.

Contacts for Further Information

Clark Winchell / NAS North Island / (619) 545-4743

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Winchell, Clark. "Natural History and Protection of Burrowing Owls." Proceedings from the Sixteenth Vertebrate Pest Conference March 1-3, 1994. University of California, Davis. 1994.

ZERO EMISSIONS / ALTERNATIVE FUELED VEHICLES

Naval Air Station North Island San Diego, California

Mission:	Compliance with Executive Order 12844, "Federal Use of Alternative Fueled Vehicles"
Contaminants:	Smog (Ozone), Nitrogen Dioxide, Carbon Monoxide, Hydrocarbons
Timeframe:	1993 through 2000
Status:	Completed, Exportable

Synopsis

NAS North Island has begun integrating zero emissions alternative fueled vehicles (ZEV) into the NAS North Island fleet. Electric vans and pickup trucks produce virtually no emissions, although they require overnight battery recharges. The overnight battery charges necessary to “fuel” the vehicles cost 60 percent less per mile than gasoline.

Two vans at NAS North Island were acquired from San Diego Gas & Electric (SDG&E), with assistance from the Low Emissions Vehicle (LEV) Group of NFESC in Port Hueneme, California. In exchange for the vehicles, NAS North Island monitors the power consumed by routine battery charging and provides monthly power and mileage data to the NFESC LEV Group. Currently only one van is operational; the other van will receive a new battery in July 1996.

The NFESC LEV Group has also initiated the General Services Administration (GSA) procurement process for a fleet of new electric pickup trucks, but it is unknown whether one of these trucks will be allocated to NAS North Island.

In May 1996, three electric carts were acquired by NAS North Island’s Staff Civil Engineer Department. The carts, called Trans2, look like modified golf carts and can accommodate two people. NAS North Island is also planning to acquire electric tow tractors for squadron use.

Use of ZEVs reduces Navy air emissions and contributes to compliance goals of both the Navy and greater San Diego County.

ZERO EMISSIONS / ALTERNATIVE FUELED VEHICLES (CONTINUED)

Date	Accomplishments
1993	ZEVs were requested.
1994	ZEVs were obtained from SDG&E, and funding was received to install charging stations.
May 1995	Charging stations were installed.
August 1995	Batteries and rebuilt brakes were installed in one van.
September 1995	First van was used by Staff Civil Engineer Department.
May 1996	Staff Civil Engineer Department acquired 3 electric carts at NAS North Island.

Date	Current Activities
July 1996	Battery is being installed in second van.
1996	Use of electric vans and carts is being monitored.

Date	Horizon
1997	Electric tow tractors will be acquired through NFESC LEV Group.
1997	Integration of ZEVs into NAS North Island fleet will continue; electric vehicle use will be exported.

Contacts for Further Information

Ken Decker / NAS North Island / (619) 545-1108

Dave Cook / NFESC / (805) 982-3477

Bibliography

San Diego Gas and Electric Clean Fuel Vehicles Flyer. March 1994.

WATERLESS URINAL RETRO-FIT PROJECT

Naval Aviation Depot North Island
San Diego, California

Mission: Water conservation
Contaminants: N/A
Timeframe: April 1995 through September 1996
Status: Completed, Exportable

Synopsis

A limited number of NADEP North Island bathroom facilities are currently equipped with No-Flush urinals manufactured by the Waterless Company of San Diego. NADEP is testing the urinals to incorporate water conservation efforts on North Island. These urinals attach to standard plumbing stubs, but do not require water to operate. Urine drains by gravity from the bowl through a patented liquid seal that provides an effective bacteria and odor barrier. The specific gravity of the liquid seal is lower than the specific gravity of the urine, and the difference in specific gravity allows the urine to drain through the liquid seal and into the sewer pipe.

On average, a single-flush urinal uses 45,000 gallons of water annually. It costs approximately \$180 per year to operate a single urinal given the current cost of water at NAS North Island, which is \$4 per 1,000 gallons. Additional cost savings are expected through reduced plumbing and maintenance costs. The purchase price of each No-Flush unit is \$438. Based on these figures, the projected payback period is 2 to 3 years.

Preliminary testing of these units indicates that they perform satisfactorily in daily use. NADEP will continue to monitor their success.

Date	Accomplishments
March 1995	Conservation PAT considered NADEP proposal.
September 1995	Funding was approved for 219 urinals.

WATERLESS URINAL RETRO-FIT PROJECT (CONTINUED)

Date	Accomplishment (Continued)
June 1996	Approximately one third of the urinals were installed.

Date	Current Activities
June - September 1996	Remaining waterless urinals are being installed.

Date	Horizon
1996+	Installation will be completed and the success of the program will be monitored. Expand use of waterless urinals at NAS North Island may occur.

Contacts for Further Information

Triet Nguyen / NADEP / (619) 545-2239

Bibliography

None available

SAM HOUSTON STATE UNIVERSITY BIRD ERADICATION TECHNOLOGY

Naval Air Station North Island
San Diego, California

Mission: Eliminate bird nuisance
Contaminants: N/A
Timeframe: Ongoing since May 1995
Status: Completed, Not Exportable

Synopsis

A technology called Rout Nuisance was considered for eliminating bird nuisance in Building 65 at NAS North Island. The system, developed by Sam Houston State University, uses solid-state electronic circuitry to produce UHF sound (20 to 30 kilohertz [kHz] at a sound pressure level of 112 decibels [dB]) at 1 meter at 2 kHz in each of four overlapping piezoceramic fan speakers, resulting in a 360 degree area of control within 600 square feet.

The NELP Conservation PAT designed a demonstration strategy to compare the efficacy and cost-effectiveness of the Sam Houston State University UHF bird eradication technology to the avian barrier system currently installed at NAS North Island. The experimental design would have incorporated a control site to assure the objectivity of the evaluation. The purpose of the demonstration was to identify the avian control technology that provided the most effective bird removal or exclusion action at the lowest operational cost. The demonstration will not be performed or pursued further because the product developer has been non-responsive.

Contacts for Further Information

Bill Collins / SWDIV / (619) 532-2337

Bibliography

None available

NELP PROJECTS

Pollution Prevention



JP-5 FUEL RECYCLER

Naval Air Station North Island

Mission:	Minimize fuel waste
Contaminants:	Waste fuel
Timeframe:	1995 to 1996
Status:	Active

Synopsis

The JP-5 Fuel Recycler at NAS North Island is a prototype effort involving the design and installation of equipment, as well as the development and implementation of operation and maintenance procedures. In accordance with Naval Air Training and Operating Procedures and Standardization (NATOPS) procedures for aircraft refueling, JP-5 fuel remaining from aircraft pre-flight checks and low point pencil drains is disposed of as waste. In the past, waste JP-5 fuel at NAS North Island was co-mingled with other waste oils and transported off the station as hazardous waste or used off site as a lower grade fuel. It was estimated by the fuel farm personnel at NAS North Island that approximately 600 gallons per week of this waste fuel are potentially recyclable. Other studies incorporating the number of squadrons and detachments assigned to NAS North Island indicate that up to 1,000 gallons per week of JP-5 fuel may be reclaimable for aircraft reuse.

The fuel recycler components have been integrated to meet the requirements for quality assurance and expected volume of recycled fuel. Most importantly, the design provides a discrete tank system to process fuel, and isolate each batch of recycled product from other fuel stock until certified for reuse. A dedicated fuel truck is used to collect and transfer the segregated JP-5 fuel to the recycler located at the NAS North Island fuel farm. A 15-gallon per minute (gpm) pump is used to: (1) load the recycler's 2,000-gallon processing tank, (2) recirculate fuel in the processing tank through the system's water separator/dehydrator/coalescer and micronic (particulate) filters, and (3) transfer certified clean fuel to the recycler's 1,000-gallon issue tank using a 100-gpm pump.

NELP is currently evaluating and conducting a cost/benefit analysis for the JP-5 fuel recycler. NELP will provide published findings when they become available.

JP-5 FUEL RECYCLER (CONTINUED)

Date	Accomplishments
January 1996	Containment pad was designed and constructed.
March 1996	Unit was installed, including electrical hook up, tank high/low level indicator lights, piping connection, and placement of filter/separator elements in the appropriate vessels.
April 1996	Test plan was finalized and approval was received from Naval Air Weapons Center (NAWC) Trenton (NATOPS Aircraft Refueling cognizant organization).
May 1996	Staff Civil Engineering Department released official standard operation procedures (SOP) for squadron-level fuel segregation.

Date	Horizon
1996	Quantitative and qualitative data on fuel recycler will be collected.
1996	A prorated/incentive system will be established to credit squadrons for the recycled fuel that they segregate.
1997	Recycling procedures and equipment will be included in the NATOPS Aircraft Refueling Manual.

Contacts for Further Information

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Karen Stallone / UTRS, Inc. / (609) 667-6770

Bibliography

Vendor brochure



INTEGRATED PEST MANAGEMENT (IPM) PLAN

Naval Air Station North Island San Diego, California

Mission: To reduce the amount of pesticides used at NAS North Island
Contaminants: Pesticides
Timeframe: January 1995 through 1996
Status: Completed, Exportable

Synopsis

The IPM Plan was prepared in response to two Navy instructions that require a written pest management plan for naval activities: OPNAVINST 5090.1B, the Environmental and Natural Resources Program Manual, and OPNAV (CNO) Instruction (OPNAVINST) 6250.4A, Pest Management Instruction. Recent Pest Management Measures of Merit, established by the ODUSE(ES) and others, a 50 percent reduction of pesticide use. This NELP initiative is intended to be used at NAS North Island and serve as a model for other IPM plans.

The IPM Plan for NAS North Island includes:

- A description of the overall plan and how it meets all the Navy requirements
- An introduction to IPM
- A description of the control methods to be instituted
- Identification of the pests at NAS North Island, including their hazard potential and a description of life cycle, habitat preferences, any beneficial use to the environment the pest may have, prevention techniques, monitoring procedures, and recommended method of control
- An evaluation of the recommended IPM practices in fiscal and health savings
- Final recommendations for IPM at NAS North Island

Date	Accomplishments
August 1995	IPM plan was completed.

INTEGRATED PEST MANAGEMENT (IPM) PLAN (CONTINUED)

Date	Horizon
FY 1996	IPM model will be exported to other Navy installations.

Contacts for Further Information

Peter Kennedy / COMNAVBASE San Diego / (619) 532-2210

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Peter A. Kennedy. An Integrated Pest Management Plan for Naval Air Station North Island, California. August 2, 1995.



DRUM WASHER

Public Works Center San Diego

Mission: Recycle and reuse emptied 55-gallon metal drums
Contaminants: Petroleum products, corrosives, and heavy metals
Timeframe: 1995 to 1997
Status: Completed, Exportable

Synopsis

PWC, San Diego's drum washer operation allows for recycling of drums, reduces new drum purchases, enables recycling of recovered material, and reduces final disposal costs. The drum washer is a fully enclosed unit that uses pressured hot water containing a detergent to wash the interior and exterior of a drum thoroughly. Various products used by the Navy are delivered in 55-gallon drums that must be disposed of after use. An emptied drum is defined as containing less than 3 percent of the original contents (by weight) or less than 1 inch of residue on the bottom of the drum.

The drum washer operation consists of a wash cycle followed by a hot rinse to remove soap residue. The effluent from the drum washer is treated on site. Drums deemed to be in good condition are washed to allow their reuse for hazardous waste collection. Drums that are damaged or do not meet the facility reuse criteria are washed and crushed for scrap metal recycling.

Date	Accomplishments
FY 1995	Drum was washer delivered to NAS North Island.

Date	Current Activities
3rd Quarter FY 1996	Installation and startup of drum washer is begun.

DRUM WASHER (CONTINUED)

Date	Horizon
FY 1996	Drum washer will continue operating and success will be exported to other installations.

Contacts for Further Information

James Sanfedele / PWC / (619) 556-9498

Bibliography

None available



ISOPROPYL ALCOHOL (IPA) VAPOR DEGREASER

Naval Aviation Depot North Island

Mission:	Replace chlorofluorocarbon (CFC) 12 and stoddard solvent
Contaminants:	CFC-12, VOCs
Timeframe:	1995 to 1996
Status:	Completed, Exportable

Synopsis

In response to the Montreal protocol to eliminate the usage of ozone depleting substances (ODS), NADEP in association with NELP has evaluated and implemented an alternative drying system that meets established military cleaning requirements. The system uses IPA vapor degreasing as an alternative to solvent cleaning. Stoddard solvent is typically used to clean aircraft bearings during refurbishment. The cleaning process uses a cascading line of solvent immersion tanks to remove grease, oil, and carbon from the bearings. Following the cleaning process, a thin, residual solvent film remains on the bearings and must be removed before continued processing. Normally, the residual film is removed using a freon (CFC-12) vapor degreaser. Aqueous-based cleaners cannot replace solvent cleaners for cleaning bearings because they may cause flash rusting.

The IPA system involves immersing the bearings in a bath of IPA vapor; the vapor condenses on the bearings and flushes the surface clean of contaminants. The bearing is then withdrawn through cooling coils that flush any residual IPA off the bearings. The IPA vapor degreasing process was found to meet the established drying standards and eliminate the use of a Class I ODS (freon). The IPA turn-key unit costs approximately \$200,000, including installation.

The IPA vapor degreaser has yielded the following benefits:

- Eliminated the use of a Class I ODS, and helped NADEP achieve Navy's ODS phase-out goals
- Reduced cost; the freon vapor degreaser used about 150 gallons of freon per year; the current cost of freon is \$150 per gallon (IPA sells for less than \$5 per gallon, resulting in a savings of \$21,750 per year)

ISOPROPYL ALCOHOL (IPA) VAPOR DEGREASER (CONTINUED)

Date	Accomplishments
FY 1994	IPA vapor degreaser was procured and delivered to NADEP North Island.
December 1994	Installation and start-up of IPA vapor degreaser occurred; cleaned bearings were evaluated to determine whether they meet the established cleaning requirements.

Date	Horizon
FY 1996	Exporting of the technology will be initiated.

Contacts for Further Information

Mel Barrera / NADEP / (619) 545-3236
S & K Products International Inc. / (914) 425-6200

Bibliography

Vendor brochure.



BIO-TECH PARTS WASHER “SMART WASHER”

Naval Air Station North Island

Mission:	Demonstrate an effective aqueous-based, environmentally friendly cleaner for use as an alternative PD-680/Safety-Kleen service
Contaminants:	PD-680
Timeframe:	1996
Status:	Completed, Exportable

Synopsis

COMNAVAIRPAC Support Equipment Rehab facility at NAS North Island is presently using a Bio-Tech's ChemFree “SmartWasher,” a state-of-the-art manual parts washer that is claimed to combine the safety of bioremediation with high performance cleaning standards. The SmartWasher uses a special filter pad to introduce microorganisms into the cleaning process. The microorganisms remain dormant until the filter pad is inserted into the proprietary nonhazardous parts cleaning solution. As the solution begins circulating within the washer, the nonpathogenic hydrocarbon-digesting microorganisms break down and consume oil and grease particles.

Because the SmartWasher is self-cleaning, there are no monthly service charges for expensive maintenance contracts. Typically, filter replacement after 30 days of normal use is the only required maintenance. The spent filter can usually be disposed of as an ordinary solid waste. The solution is topped off occasionally, as necessary, but does not require replacement.

The cleaning solution used in the SmartWasher is a biodegradable, nonflammable, noncorrosive, nontoxic oil dispersant and cleanser that contains no VOCs, no known carcinogens, and no Occupational Safety and Health Agency (OSHA)- or Department of Transportation (DOT)-regulated chemicals. The San Diego County APCD has declared the cleaning solution as exempt from District rules and permit requirements, as packaged in the SmartWasher.

The SmartWasher itself is constructed of rugged high-impact, high-density polyethylene, and thus has no parts that can rust. The unit is equipped with an industrial heater that maintains a constant temperature of 105 °F, the optimal multiplying environment for the microorganisms.

BIO-TECH PARTS WASHER “SMART WASHER” (CONTINUED)

The SmartWasher is located adjacent to a Safety Kleen parts washer that uses the solvent PD-680. Personnel in the shop consistently prefer to use the SmartWasher to wash parts. Unlike PD-680 or mineral spirits, the aqueous-based cleaning solution does not sting or burn and emits a pleasant odor.

NELP is currently conducting a cost/benefit analysis for the SmartWasher. The findings will be exported when they become available.

Date	Accomplishments
January 1996	Procured and installed unit.
May 1996	Received official APCD exemption.
April 1996	Successfully implemented at AIRPAC SE REHAB facility.

Date	Horizon
1996	Explore using the aqueous-based cleaner/microbial solution in the stainless steel automatic parts washer.
1997	Complete the evaluation of the SmartWasher and export technology.

Contacts for Further Information

Ed Bonnes / NAS North Island / (619) 545-3426

Hector Padilla / COMNAVAIRPAC SE REHAB / (619) 545-6692

Bibliography

Vendor brochure.

POLLUTION PREVENTION PROGRAM DEVELOPMENT

**Naval Air Station North Island
San Diego, California**

Mission: Pollution prevention
Contaminants: Various
Timeframe: Ongoing
Status: Active

Synopsis

The P2 program at NAS North Island consists of the following components: P2 process action team (PAT), P2 plan, P2 training, and P2 technology export. Ongoing activities include installing P2 equipment procured through the CNO centralized procurement program in FY 1995 and 1996, such as a wash rack recycling system, a pneumatic spill vacuum, a oil filter crusher, and paint tainter/mixer powder coat equipment. NELP also evaluates P2 opportunities on a continuing basis and coordinates its findings with ongoing P2 activities. The use of all available information and resources with effective coordination has avoided duplication of effort and ensures that the most feasible options are implemented at NAS North Island. A P2 PAT was established with representatives from the tenant commands at NAS North Island (including PWC San Diego, NADEP, and AIMD). The P2 PAT actively strives to implement and export technologies that reduce existing sources of pollution or minimize the potential for accidental release of pollutants.

Date	Accomplishments
December 1994	P2 equipment was procured in FY 1994 was delivered to NAS North Island.
January 1995	First meetings of NAS North Island P2 PAT team was held.
February 1995	NAS North Island representatives participated in the CNO/NAVAIR P2 steering committee meeting to discuss P2 equipment procurement status and future procurement plans.
March 1995	P2 workshop for P2 managers was conducted.
FY 1995	NAS North Island collected performance data on the FY 1994 technologies and reported findings to CNO.

POLLUTION PREVENTION PROGRAM DEVELOPMENT (CONTINUED)

Date	Accomplishments (Continued)
December 1995	P2 equipment procured in FY 1995 was delivered to NAS North Island.
April 1995	Facility was modified as necessary to install procured P2 equipment.

Date	Current Activities
FY 1995 to 1996	Refining P2 plan is continuing; P2 program will develop and use the collected data to implement P2 opportunities, and provide P2 training, as necessary.
	Facility modification is performed, as necessary, to install P2 equipment.

Date	Horizon
FY 1996	P2 equipment will continue to be procured and installed; successes will be monitored and exported.

Contacts for Further Information

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Dave Asiello / CNO / (703) 602-5334

Dan Glass / CNO / (703) 602-4497

Bibliography

NAS North Island Pollution Prevention Plan, Naval Air Station North Island, California, 1995.

NFESC Navy Pollution Prevention Opportunity Handbook, (Draft), 1994.

CNO Naval Shore Installation Pollution Prevention Planning Guide, October 1994.

NAS North Island Pollution Prevention Plan, Draft, December 1994.

POLLUTION PREVENTION IMPLEMENTATION HANDBOOK

Naval Aviation Depot North Island

Mission:	Pollution prevention technology transfer
Contaminants:	Various
Timeframe:	January 1995 through 1996
Status:	Active

Synopsis

As part of NAS North Island technology transfer efforts, NELP is preparing a P2 implementation handbook in 1996 that describes NADEP, North Island P2 success stories. The primary focus of the handbook is to provide approved alternative processes and materials that can replace hazardous materials commonly used in naval aviation maintenance operations.

The handbook is intended to share successful P2 strategies and technologies and to promote technology transfer among Navy command-level personnel. The handbook will present P2 strategies that have been successfully implemented for Navy maintenance activities, will provide sufficient information to allow working-level personnel to implement alternative P2 technologies or processes, and will provide detailed cost/benefit analyses. As additional P2 options are approved, the handbook is expected to be updated periodically to include the new P2 alternatives.

In terms of technology transfer, NELP expects that the P2 implementation handbook will be useful to Navy personnel for (1) conducting aircraft maintenance operations (in accordance with OPNAVINST 4790.2E) and (2) implementing P2 programs and techniques to meet the requirements of Executive Order 12856 and OPNAVINST 5090.1B.

POLLUTION PREVENTION IMPLEMENTATION HANDBOOK (CONTINUED)

Date	Accomplishments
February 1995	NAS North Island reviewed existing EPA, DoD, and Navy P2 technology transfer formats and prepared a format considered most useful to working-level personnel.
February to March 1995	NAS North Island collected P2 success stories from NADEP activities.
April 1995	Draft P2 implementation handbook was submitted for review and approval.

Date	Horizon
FY 1996	Additional P2 information will be updated into the P2 handbook.
	Handbook will be submitted to other commands for review and approval.
	P2 implementation handbook will be distributed to other Navy installations.

Contacts for Further Information

Mel Barrera / NADEP / (619) 545-3236

Ed Bonnes / NAS North Island / (619) 545-2709

Dave Asiello / CNO / (703) 602-5334 x 4642

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NFESC. Navy Pollution Prevention Opportunity Handbook (Draft), 1994.

Gallop, Lt. Mike. USS Theodore Roosevelt Environmental Compliance Program "Cookbook."

CNO. Naval Shore Installation Pollution Prevention Planning Guide. October 1994.

ALTERNATIVE PIER PILING RETROFIT

Naval Air Station North Island San Diego, California

Mission: Eliminate creosote contamination of groundwater
Contaminants: Creosote
Timeframe: September 1994 through 1996
Status: Active

Synopsis

High-density polyethylene (HDPE) pier-pilings are being evaluated as a replacement for treated wood pilings to eliminate creosote contamination of groundwater at NAS North Island. Based on the anticipated life span and durability of plastic fender pilings, retrofitting treated timber piling with plastic pilings could save the Navy as much as \$37,000 per fender piling over 40 years. Additionally, the use of 100 percent recycled plastic piling will substantially reduce the environmental liability associated with traditional treated timber pilings.

A demonstration test plan was prepared for evaluating steel- and fiber glass-reinforced HDPE plastic pilings to be used as fender pilings at NAS North Island Pier Bravo. The demonstration will assess the plastic piling's effectiveness under heavy use conditions during a 2-year study. The plastic pilings will be evaluated primarily for durability, strength, cost, and environmental integrity.

Date	Accomplishments
October 1994	NFESC and NAS North Island SCE personnel held a meeting to discuss using alternative pier pilings.
November 1994	Pier Bravo was designated as the demonstration site for retrofitting the pilings.
March 1995	Alternative Pier Piling Demonstration Plan was developed
	NFESC finalized a draft report on alternative pier piling research.
1996	Fender pilings were installed at Pier Bravo.

ALTERNATIVE PIER PILING RETROFIT (CONTINUED)

Date	Horizon
FY 1996 - FY 1998	Alternative pier pilings will be evaluated at Pier Bravo.

Contact for Further Information

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Plastic Piling Inc. / 8560 Vineyard, Suite 205, Rancho Cucamonga, CA 91730 / (909) 989-7685

Bibliography

NAS North Island Alternative Pier Piling Demonstration Plan at Pier Bravo, NAS North Island, 1995.

CNG FUELING STATION/ ALTERNATIVE FUELED VEHICLES

Naval Air Station North Island

Mission: Use of alternative fuel for Navy fleet vehicles
Contaminants: Nitrogen oxides, hydrocarbons, and carbon monoxide
Timeframe: 1993 through 1998
Status: Completed, Exportable

Synopsis

A compressed natural gas (CNG) fueling station has been installed at NAS North Island to allow the permanent assignment of CNG-fueled vehicles at North Island. The new CNG station at NAS North Island and the existing CNG station at Naval Station (NS) 32nd Street are necessary to allow the Navy PWC to convert 1,200 of its fleet of 3,600 vehicles to CNG by 1998. Planned CNG facilities at NAS Miramar and the Point Loma Complex are awaiting funding before completion. This network of CNG fueling stations will augment the six public CNG fueling stations in San Diego County. The military also has access to 14 other CNG fueling stations owned by San Diego Gas & Electric. Two hundred and fifty gasoline powered vehicles have been converted since the program began in 1993. By applying lessons learned in the past three years, PWC hopes to accelerate the conversion of existing and new vehicles to 300 vehicles per year. PWC has also volunteered to serve as a test activity for electric vehicles. The use of CNG-fueled and electric vehicles reduces operating costs, reduces emission of ozone precursors, and will help San Diego County reach attainment for ozone by 1999.

Date	Accomplishments
1993	Converted 50 Navy vehicles (San Diego wide).
1994	Converted 80 Navy vehicles (San Diego wide).
1995	Converted 120 Navy vehicles (San Diego wide).

CNG FUELING STATION/

ALTERNATIVE FUELED VEHICLES (CONTINUED)

Date	Horizon
1996 - 1998	Convert 300 Navy vehicles per year (San Diego wide).

Contact for Further Information

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Bibliography

None available.

POLLUTION PREVENTION PLAN PROTOTYPE

Naval Air Station North Island San Diego, California

Mission: Develop prototype pollution prevention plan
Contaminants: Various
Timeframe: January 1994 through March 1995
Status: Completed, Exported

Synopsis

On November 19, 1993, Chief of Naval Operators (CNO) (N45) requested that NAS North Island and Naval Station (NAVSTA) Mayport assist in producing P2 plans for use as prototypes at other naval commands (AIMD, Aircraft Squadrons, Supervisor of Ship Maintenance). CNO distributed the P2 plan prototype in electronic form in FY 1995.

The P2 plan presents NAS North Island's P2 policy; the P2 plan's applicability and scope (including P2 goals); NAS North Island installation information; management and administrative elements; planned process-specific improvements; P2 priorities; installation-specific potential barriers to P2; other requirements; and the Commanding Officer's statement and approval.

Date	Accomplishments
June 1994	CNO data collection teams surveyed selected NAS North Island operations to generate process mass balance diagrams and P2 data.
October 1994	Eight of the ten P2 plan sections to CNO was prepared and delivered, as requested by CNO.
December 1994	The draft P2 plan CNO was compiled and delivered for NAS North Island review.
February 1995	comments on the draft P2 plan was submitted to CNO.
April 1995	CNO/NFESC distributed electronic and hard copies of the NAS North Island prototype P2 plan for use by other installations. P2 plan was exported to 349 Navy activities.

POLLUTION PREVENTION PLAN PROTOTYPE (CONTINUED)

Date	Current Activities
1996	P2 plan is continuing to be refined.

Contacts for Further Information

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Larry Hill / NFESC / (805) 982-4795

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NFESC, Navy Pollution Prevention Opportunity Handbook (Draft), 1994.

Lt. Mike Gallop, USS Theodore Roosevelt Environmental Compliance Program "Cookbook."

CNO, Naval Shore Installation Pollution Prevention Planning Guide, October 1994.

PLASTIC MEDIA BLAST BOOTH

Naval Aviation Depot North Island
San Diego, California

Mission: To reduce the use of methylene chloride paint strippers
Contaminants: Methylene chloride
Timeframe: 1994
Status: Completed, Exportable

Synopsis

NADEP North Island reduced its reliance on chemical paint strippers by implementing plastic media blasting (PMB). PMB is a dry abrasive blasting process designed to replace chemical stripping. The blasting occurs in an enclosed, ventilated chamber or compartment and uses a stream of reusable plastic granular media propelled by a pressured air stream (20 to 30 pounds per square inch). After blasting, the spent media, dust, and debris are routed to a media recovery and reclamation system consisting of a magnetic separator, a cyclone centrifuge, and a vibratory screen. Typically, the media can be reused several times before becoming too small to remove paint effectively. Currently, NADEP is studying the use of media other than plastic, such as walnut shells, to reduce solid waste volume.

In addition, a glove box unit for PMB was procured through the CNO centralized procurement program and installed at AIMD in 1994. The performance of the glove box unit is under evaluation.

The NADEP PMB unit has yielded the following benefits:

- Eliminates approximately 40,622 pounds of hazardous paint waste annually, resulting in a savings of \$81,244 per year
- Reclaims and reuses plastic media, resulting in additional cost savings of \$19,595 per year in material cost

PLASTIC MEDIA BLAST BOOTH (CONTINUED)

Date	Accomplishments
July 1994	PMB was implemented at NADEP North Island.
Summer 1994	AIMD airframes tested a glove box unit for PMB under guidance from NAWCADLKE.
December 1994	A glove box unit was installed at AIMD airframes.

Date	Horizon
FY 1996	Plastic media may be replaced with walnut shell media when funding becomes available.

Contacts for Further Information

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AOC Monty Koller / NAS North Island / (619) 545-0617

Bibliography

Vendor brochure.

ELECTROLYTIC RECOVERY UNIT

Naval Aviation Depot North Island
San Diego, California

Mission:	To reduce hazardous waste generated from plating baths
Contaminants:	Heavy metals and cyanide
Timeframe:	1993
Status:	Completed, Exportable

Synopsis

NADEP North Island uses electroplating in repair and rework manufacturing processes. Metal cyanide plating baths contribute the largest portion of the waste generated in the electroplating process. Wastewater from these baths, contaminated with heavy metals and cyanide, must be treated by an industrial wastewater pretreatment process before it is discharged to a municipal wastewater treatment facility.

The electrolytic recovery unit (ERU) uses an electrical current to anodize metals and oxidize the cyanide in the rinsing bath water. Metals are recovered and can be returned to the plating bath as an anode source. Cyanide is oxidized into cyanate, nitrogen, and carbon dioxide gas. The amount of change-out for the rinse tank is greatly reduced. In addition, NADEP is exploring an opportunity to replace stainless-steel plates with titanium plates to allow the ERU to operate 24 hours a day. By operating 24 hours a day, the ERU can reduce the costs of corrosion control in the rinse tanks.

The ERU has generated the following benefits:

- The ERU can remove and recover more than 90 percent of the heavy metals in the rinse water, resulting in a savings of approximately \$5,000 per year
- The ERU destroys approximately 50 percent of the cyanide, reducing the amount of pretreatment required before discharging into the industrial waste treatment plant
- The ERU reduces the volume of metal-containing hazardous waste sludge at the industrial waste treatment plant, resulting in a savings of approximately \$1,500 per year

ELECTROLYTIC RECOVERY UNIT

(CONTINUED)

Date	Accomplishments
April 1993	ERU was implemented.

Date	Current Activities
FY 1996	NADEP is exploring an opportunity to allow the ERU to operate 24 hours a day.

Date	Horizon
FY 1996	ERU will be implemented in other rinse tanks for metals recovery and cyanide destruction.
1996	ERU will be documented in NADEP P2 implementation handbook.

Mel Barrera / NADEP / (619) 545-3256

Contacts for Further Information

Vendor brochure.

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CAN CRUSHER/COMPACTOR AND AEROSOL CAN PUNCTURER

Naval Aviation Depot North Island
San Diego, California

Mission:	Volume reduction of hazardous solid wastes
Contaminants:	Hazardous solid wastes
Timeframe:	Implemented in 1994
Status:	Completed, Exportable

Synopsis

NADEP North Island is using a can crusher/compactor to compact emptied 5-gallon metal containers before recycling. The crusher was configured to compact a variety of materials. NADEP also uses the crusher to compact contaminated solids such as rags, paper towels, and mixing cups to reduce the number of containers required for shipment of these hazardous wastes.

In addition, aerosol can puncturer is being used to rupture the spent aerosol can to reduce the pressure to atmosphere before the can is disposed of as municipal waste. Spent aerosol cans are normally classified as hazardous waste due to the residue content under pressure.

The can crusher/compactor and aerosol can puncturer have generated the following benefits:

- Reduced the volume of the hazardous solid waste generated at NADEP
- Reduced the costs for solid waste disposal
- Facilitated recycling of 20,653 pounds of empty 5-gallon metal cans per year
- Allowed management of 1,928 pounds of aerosol cans generated at NADEP per year as municipal waste rather than hazardous waste
- Reduced the volume of 81,330 pounds of contaminated rags per year

A can crusher was also procured through the CNO centralized P2 procurement program for the NAS North Island recycling program. The cost/benefit of the can crusher at NAS North Island will be evaluated under NELP, and findings will be exported when they become available.

CAN CRUSHER/COMPACTOR AND AEROSOL CAN PUNCTURER (CONTINUED)

Date	Accomplishments
August 1994	Aerosol puncturer was implemented.
May 1995	Can crusher/compactor was implemented.
April 1995	Can crusher/compactor was installed at the NAS North Island recycling compound.

Date	Horizon
FY 1996	Future solid waste reduction opportunities will be continue to be explored.
	Can crusher/compactor and aerosol can puncturer will be documented in NADEP P2 implementation handbook.

Contacts for Further Information

Mel Barrera / NADEP / (619) 545-3236

Dan Manjarrez / NASNI Solid Waste Program Manager / (619) 545-4943

Bibliography

Vendor brochure.

AQUEOUS PARTS WASHER

Naval Air Station North Island

Mission:	To reduce the use of ozone depleting substances
Contaminants:	PD-680, 1,1,1-trichlorethene, and freon-113
Timeframe:	1994
Status:	Completed, Exportable

Synopsis

Traditionally, NADEP North Island used PD-680 (stoddard solvent) and ODS to clean various engine and aircraft components. In an attempt to eliminate the generation of hazardous waste, NADEP reduced and replaced the cleaning process that used the hazardous solvent with aqueous parts washers. The parts washers use heated aqueous solutions with alkaline detergent and a high pressure spray. The washers feature a filter that continuously removes solid contaminants suspended in solution and a disc-type oil skimmer that removes floating oil. The aqueous cleaning solution is recirculated several cycles before it is disposed of as industrial waste. At NADEP, parts washers have eliminated 17 vapor degreasers, each containing 10 to 15 gallons of ODS. Additionally, NADEP will explore a more efficient recycling system to separate detergent and water, and the viability of operating the power parts washer at lower temperature to reduce energy consumption. NADEP material laboratory will explore wider application of the power parts washer.

Two additional aqueous parts washers have been procured and installed at the NAS North Island COMNAVAIRPAC support equipment shop and AIMD airframe division through the CNO centralized P2 procurement program. This equipment is currently under evaluation, and NAS North Island NELP will present these findings when they become available.

Installing the aqueous parts washer at NADEP yielded the following benefits:

- Reduced the amount of PD-680 and ODS used to clean engine and aircraft components
- Eliminated health risks associated with PD-680 use
- Reduced cleaning material costs by approximately \$1,000 per year
- Reduced off-site transportation and recycling of PD-680 solvent

AQUEOUS PARTS WASHER (CONTINUED)

Date	Accomplishments
September 1993	Aqueous parts washer was implemented including oil/water separator with alkaline detergent.
FY 1994	Foaming problems were reduced with rust inhibitor.
February and March 1994	Aqueous parts washers were installed at COMNAVAIRPAC support equipment shop and AIMD airframes.

Date	Horizon
1997	NADEP will explore a more efficient recycling system, and the viability of operating the aqueous parts washer at lower temperature.
Summer/Fall 1996	Aqueous parts washers at COMNAVAIRPAC and AIMD airframes will be tested in accordance with NAWCADLKE test plans.

Contacts for Further Information

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Vendor brochure.

APPENDIX A

APPENDIX A

NELP BACKGROUND

The Navy Environmental Leadership Program (NELP) is an initiative to develop innovative treatment technologies and management procedures that address a variety of environmental challenges facing the Navy.

NELP demonstrates innovative environmental cleanup, compliance, conservation, and pollution prevention (P2) technologies, and controls. When successful, the technologies are exported Navy-wide to accelerate cleanups and improve environmental management techniques.

Naval Air Station (NAS) North Island at San Diego, California, and Naval Station (NAVSTA) Mayport in Florida have been identified as NELP bases and are demonstrating innovative technologies.

Management Team

The key to successful operation of a complex, broad-scoped program such as NELP is the effectiveness of the management team. NELP has selected a simple and efficient organizational design that maximizes functional capabilities while minimizing unnecessary controls and administrative costs.

Figure A-1 presents the NELP management team members and points of contact.

Other NELP partners for various projects include:

- Naval Command, Control, and Ocean Surveillance Center (NCCOSC)
- Naval Facilities Engineering Service Center (NFESC)
- NAVSTA Mayport
- Naval Facilities Engineering Command (NAVFAC) Headquarters
- Naval Air Systems Command (NAVAIR) Headquarters
- Naval Air Warfare Center (NAWC) Lakehurst
- Resident Officer In Charge of Construction (ROICC)
- Commander, Naval Base (San Diego) (COMNAVBASE)
- Fleet Industrial Supply Center (FISC)
- Commander, Naval Air Forces; U.S. Pacific Fleet (AIRPAC)

Figure A-1. NELP Management Team

NELP MANAGEMENT TEAM

NAVAL AIR STATION NORTH ISLAND

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NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST DIVISION

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Phone: (619) 532-2337
FAX: (619) 532-1242
E-mail: wecollins@efdwest.navfac.navy.mil

- Supervisor of Shipbuilding (SUPSHIPS)
- Naval Occupational Safety and Health (NAVOSH)
- Air Antisubmarine Squadron-41 (VS-41)
- U.S. Environmental Protection Agency (EPA) Superfund Innovative Technology Evaluation (SITE) Program
- Western Governors Association
- Regulatory Agencies
 - San Diego County Air Pollution Control District (APCD)
 - County of San Diego Hazardous Materials Management Division (HMMD)
 - California Regional Water Quality Control Board (RWQCB)
 - California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)
 - EPA
- EPA Technology Innovation Office
- NAS North Island Restoration Advisory Board
- Clean Sites, Inc.
- Border groups
- Contractors

The organizational management structure and relationships of the NAS North Island NELP partners are illustrated in Figure A-2.

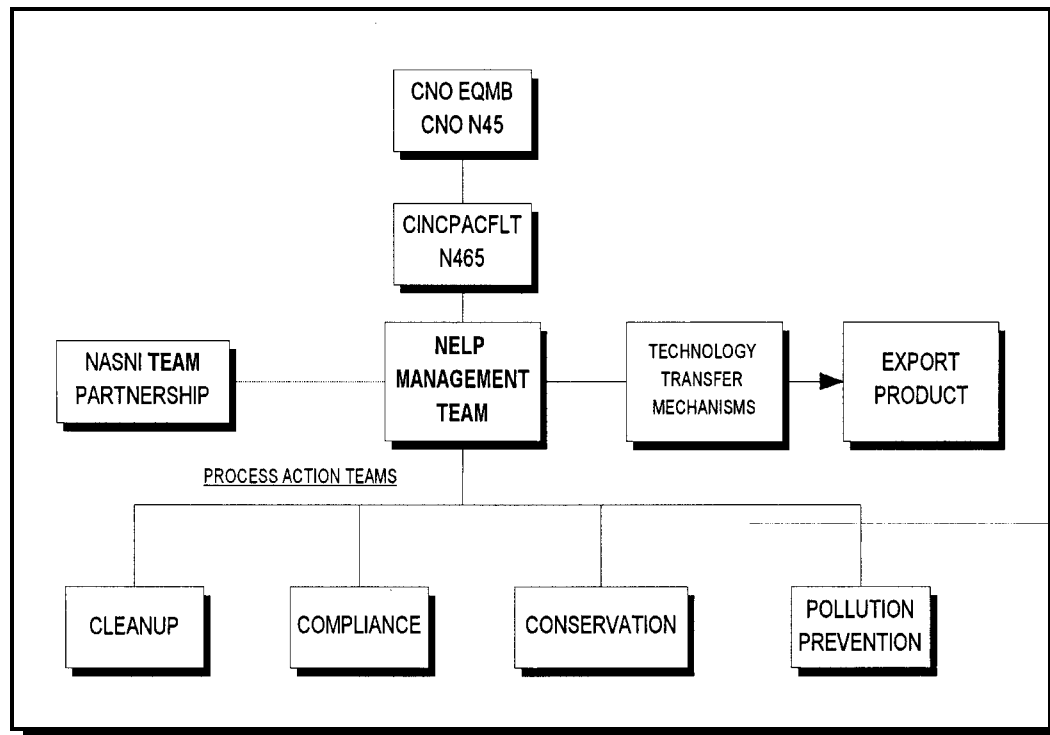


Figure A-2. NAS North Island NELP Management Structure

Process Action Teams

Identification of problems and ideas for innovative solutions often come from the user community dealing with the issues on a daily basis. In recognition of this, the NELP management team established Process Action Teams (PAT) in the areas of cleanup, compliance, conservation, and P2. Each PAT includes representatives from the tenant commands at NAS North Island and other cooperating NELP participants and is sponsored by a member of the NELP management team. The PATs are charged with identification and evaluation of candidate NELP projects. See the NELP charter for PATs following this section.

Specifically, the Cleanup PAT identifies and prioritizes remediation problem areas and implements innovative projects and methodologies to achieve quicker, more cost effective cleanups. The Compliance PAT focuses on development of methods to streamline regulatory compliance and to coordinate requirements between regulatory programs and agencies. The Conservation PAT is responsible for identifying innovative methods to conserve and protect natural, cultural, and energy resources. The P2 PAT strives to implement innovative technologies rapidly in order to reduce existing sources of pollution or minimize the potential for accidental release of pollutants. Projects that pass the PAT evaluation are forwarded to the NELP management team, which makes the ultimate decision as to which projects are implemented.

NELP Charter and Mission Statement

The Chief of Naval Operations (CNO) Environmental Quality Management Board (EQMB) established NELP to find new and better ways to manage day-to-day efforts in its environmental programs. The Secretary of the Navy approved NELP for implementation in October 1993. This charter was incorporated in the following vision statement:

NELP activities will serve as test beds for new and innovative technologies and focused management to address the full spectrum of environmental issues and will export their successes throughout the Navy.

NAS North Island has developed a local charter to identify the whole intent and mission of NELP and to recognize the importance of including all major tenant commands as key players to achieve success. The NAS North Island charter has been signed by all major participants' Commanding Officers. The attachments that follow include a memorandum from the Secretary of the Navy approving NELP, the NELP management team charter, the NELP charter for PATs, endorsements from Naval Aviation Depot (NADEP), NAVFAC Southwest Division (SWDIV), and Navy Public Works Center (PWC), and the action memorandum from the CNO requesting approval to implement NELP.

Specific NELP Objectives

The specific NELP objectives at NAS North Island are to sustain the following on an ongoing basis:

- Ten environmental cleanup projects
- Five environmental compliance projects
- Five conservation projects
- Ten P2 projects

NELP Implementation Approach

NELP implementation at NAS North Island addresses the four focus areas of the NELP program: environmental cleanup, environmental compliance, conservation, and P2. Implementation includes demonstrating innovative technologies, focused management techniques, and exporting successes Navy-wide. The implementation approach also establishes partnerships among NAS North Island personnel, the NELP management team, the regulatory agencies, and the community.

New Technologies (NT) — SWDIV

A request for proposal (RFP) was issued on April 25, 1994 for innovative technologies for cleanup, compliance, conservation, and P2 at NAS North Island is one mechanism for inviting developers of new technologies to participate in NELP at NAS North Island. Main issues listed in the RFP were low/zero emission automobiles, nitrogen oxides (NO_x) controls for ground support equipment (GSE), alternates to patch test, chromate free primers, rag cleaning technology, and Installation Restoration (IR)/Underground Storage Tank (UST) cleanup technologies. In response to the solicitation, 40 proposals were received and 7 developers were selected for cost-sharing technology demonstrations. Three cleanup technologies, two compliance technologies, one P2 technology, and one conservation technology were selected.

NELP Technologies Initiative II (NTI II) — NFESC

NFESC has issued two Broad Agency Announcements (BAA) as part of NAVFAC's New Technologies Initiative. In December 1995, NFESC issued the first BAA to address specific areas of environmental technology needs at the two NELP bases, NAVSTA Mayport and NAS North Island.

A second BAA was issued by NFESC on May 10, 1996, which seeks abstracts of technologies to obtain innovative solutions in the areas of pollution prevention, compliance, conservation, and cleanup. Technology developers or vendors may then be asked to submit a full technical and cost proposal for contract and administration.

EPA Superfund Innovative Technology Evaluation (SITE) Program

Another mechanism for demonstrating innovative technologies at NAS North Island is EPA's SITE Program. The 1986 amendments to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) mandate that EPA select, to the maximum extent practicable, remedial actions at Superfund sites that create permanent solutions for contamination that affects human health and the environment. In response to this mandate, the SITE Program was established by EPA's Office of Solid Waste and Emergency Response (OSWER) and Office of Research and Development (ORD). The SITE Program's primary purpose is to maximize the use of alternatives in cleaning up hazardous waste sites across the country by encouraging the development and demonstration of new, innovative treatment and monitoring technologies.

NAS North Island TEAM - An Innovative Environmental Partnership

SWDIV played a key role in the cleanup program by spearheading the establishment of the NAS North Island TEAM Environmental Partnership in 1993. The NASNI TEAM was originally established to facilitate partnering and communication among all parties involved in the IR Program.

The NASNI TEAM consists of Navy activity environmental program representatives (NAS North Island, SWDIV, NADEP, Public Works Center San Diego (PWC), NFESC, PAO, and ROICC), the cognizant regulatory agencies (DTSC, RWQCB, HMMD, and APCD), community stakeholders, and environmental support contractors (Bechtel, Jacobs, PRC, IT, Metcalf and Eddy, and OHM).

In 1994, the TEAM decided to further enhance the partnership by encompassing all environmental activity at NASNI, not just cleanup. Thus, the TEAM members have developed a mission statement: "NAS North Island - The Navy's Environmental Leader."

The TEAM has held ten meetings to date, including two off-site team building seminars in January 1993 and January 1994. The TEAM now meets quarterly to continue its mission of making NASNI the Navy's environmental leader, and its mission complements the NELP. Specific accomplishments of the TEAM include development of a base Management Action Plan (MAP), RCRA corrective action schedules, adoption of Program Managers meetings to enhance IR communication, and definition of the functional elements and associated tasks required to achieve the team mission.

NAS NORTH ISLAND BACKGROUND

NAS North Island is the largest aviation industrial complex on the West Coast and is home to two aircraft carriers and the Third Fleet flag ship, USS Coronado. The North Island station is located at the northern end of the peninsula that forms San Diego Bay and borders the City of Coronado. The 2,806-acre complex, officially commissioned in 1917, provides aviation support services to the fleet, aircraft maintenance, airfield operations, pier-site services, and logistics. Approximately 250 aircraft are based at NAS North Island, and the station provides service at several levels. Aircraft squadrons provide basic service for these aircraft, including preventive maintenance. The Aircraft Intermediate Maintenance Department (AIMD) provides higher levels of services, such as engine overhauls. The highest level of maintenance is carried out by Naval Aviation Depot (NADEP) and involves extensive remanufacturing, replacement or modification, and major overhaul to all types of aircraft. Aircraft maintenance and repair generate the largest quantities of hazardous waste at NAS North Island. Current industrial waste disposal operations comply with the RCRA corrective action program and all other applicable federal, state, and local laws and regulations. In addition to the North Island station, the NAS North Island commands also operate from Naval Auxiliary Landing Field (NALF) San Clemente Island, Naval Outlying Field (NOLF) Imperial Beach, and Survival, Evasion, Resistance, and Escape (SERE) Camp Warner Springs.

Insert